



Addis Ababa University
College of Natural and Computational Sciences
Department of Zoological Sciences

**Assessments of Socio-Cultural importance of Tree plant Species growing in
five Ethiopian orthodox churches at Addis Ababa.**

By
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MSc Thesis

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**Submitted to the Department of Zoological Sciences in partial fulfillment
for the requirements of the Degree of Masters of Sciences in Biology**

Advisor: Dr. Sutuma Edessa

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This is to certify that the Thesis prepared by Tigist Nigussie entitled: “Assessments of Socio-Cultural importance of Tree plant Species growing in five Ethiopian orthodox churches at Addis Ababa. and submitted to the Department of Zoological Sciences in partial fulfillment for the requirements of the Degree of Masters of Sciences in Biology complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

By Tigist Nigussie _____

Signed by the Examining Committee:

Examiner _____ Signature _____ Date _____

Advisor _____ Signature _____ Date _____

Head of the Department or Coordinator

Abstract

The purpose of the study was to assess Socio-Cultural importance of Tree plant Species growing in five Ethiopian orthodox churches at Addis Ababa. Descriptive methods of data evaluation and analyses were employed.) As a result, Even though it has economic importance narcotic or psychotropic plants and short life trees are not grown in the church compound. Seedling planting was part of the plan during the church planning. The study shows number of trees was reducing but the church environment was better compared to other environments. socio cultural importance of trees were described-trees serve as sources of clean and cool air and were able resist drought and heavy wind in the church compound and reputation to the church environment, reduce disease prevalence such as malaria, serve as source of herbal medicine and reduce medical expenses, people gather under church trees fresh air shed to celebrate holidays, people take a break under it, it also provide multiple benefits and shelter for wild animals. In conclusion, the Ethiopian ortodox church was contributing to the microclimate church environment and the city too. Government and other community even individuals can learn a lot from this best practice.

Keywords: *Deacons, Nuns, Priests, Orthodox Church, socio-cultural and Orthodox Churchyard Tree plant*

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Chapter one

1. Introduction

1.1. Background of the study

Most of the Ethiopian Orthodox Tewahido Church and monasteries are built on hills, mountains and high places with densely forests and trees. This practice and tradition came from Eden, the place had all the best and choicest trees and plant, God a tender Father, provide not only for Adam's needs, but also his pleasure. The church on the earth signifies the new heaven, the holy city, New Jerusalem, coming down of God out of heaven, prepared as a bride adorned for her husband, Adam. Therefore, gardening was the first kind of employment on record in which man was engaged. Though trees and plants produced the necessary flower and fruits by the will of God, dressing and keeping are necessary to maintain in their perfection. This is the underlying principle often considered and practiced by Ethiopian Orthodox Tewahido Church in nature conservation (Tulu Tolla et al, 2017).

For Christians and Jews alike the biblical story of human interaction with the world begins with God's commands regarding two trees. The first things which the first people found in the Garden were two trees. The way those first people responded reflected their relationship to their Creator and their fidelity to the commands given to them (Abate Gobena, 2018).

According to Abiyou, many tree species surrounding religious areas have relationship with the term sacred groves in most literature. The tradition of the sacred grove is well known in Ethiopian tradition in the experience of traditional religion as the Oromo sacred "Adbar" or in the clump of trees that customarily envelope the Debr (Bahru Zewde, 1997). Sacred groves are smaller or larger ecosystems, set aside for religious purposes. The origin of sacred groves can be attributed to the slash and burn system of agriculture, where several forests patches was left standing around farmlands. These groves came to be institutionalized as centers for culture and religious life. Taboos and social sanctions protect the sacred groves from deterioration due to human interference. These habitat patches may be the only primary forests remaining locally. Several endemic and endangered species have been recorded from sacred groves. Sacred groves, which form In SITU conservation sites and act as a refuge for species, are becoming ecologically important in the light of the current rates of deforestation

and species loss. They buffer against the depletion of genetically adapted local variants and overall biodiversity in a region. They can serve as important recruitment areas to surrounding ecosystems. Sacred groves are of great economic significance too (AlemayehuWassie, 2002) as cited in (Abiyou Tilahun, 2015).

The doctrine of the religions behind those sacred groves may vary but ultimately the experience of conserving trees for religion purposes is apparent worldwide. Thus, trees not only meet the economic and ecological needs of the people, but also form an integral part of their culture and spiritual tradition (Yeraswork Admassie, 1995) as cited in (Abiyou Tilahun, 2015).

The Ethiopia Orthodox Tewahido Church has long history of planting and conserving tree species. Church compounds are the monasteries of trees and other biodiversity resources where one can animate trees escaped from being destroyed forever under the shelter of the church value and esteem.

Many indigenous trees and shrubs destroyed completely over the last century are still found standing in the compounds of rural churches (Taye Bekele, 1998) as cited in (Abiyou Tilahun, 2015). The area of forest cover preserved by the Ethiopian Orthodox churches in some parts of the country has been declined and found in patches. These patches of forests are used as sources of seeds for raising seedlings in nurseries (EFAP, 1996) as cited in (Abiyou Tilahun, 2015).

Church compounds are serving as in situ conservation and hot spot sites for biodiversity resources, mainly indigenous trees and shrubs of Ethiopia, which in turn give prestige for the religious sites. As a result, these forests are sanctuaries for different organisms ranging from microbes to large animals, which will have almost disappeared elsewhere. Historically, most of the church forests was destroyed and burned with the churches and other precious heritages by the anti-Christian expedition led by “Ahmed Ibn Ibrahim” also called ‘Gragh’ meaning ‘left handed’ in the beginning of the 16th century. After ‘Gragh’ has been killed in 1543, most of the churches and monasteries were reconstructed together with their forests (Aymro Wondmagegnehu and Motovu, 1970).

In the process of nationalization of private properties during the socialist regime the EOTC was left without its land holdings, including the forests, which have been preserved for

centuries. The study conducted by JICA in South Africa showed that forest areas accounting for approximately 31% of the terrestrial part of the earth play important roles for human beings and the environment that the provision of daily commodities (timber, firewood, on-timber forest products, etc.), soil conservation, habitats for flora and fauna, and absorption of carbon dioxide (Japan International Cooperation Agency (JICA), 2013).

It is estimated that 13 million hectares of forest has been decreasing annually due to agricultural development, logging, forest fires, and other causes in developing countries. Greenhouse gas derived from deforestation and forest degradation is estimated to account for 20% of the increased greenhouse gas around world (Japan International Cooperation Agency (JICA), 2013).

The fate of those forests was ruthless exploitation and destruction, which in turn brought a severe reduction in biological diversity and ecological imbalance as well (Abiyou Tilahun, 2015).

1.2. Statement of the Problem

Forests (trees) have Ecological, Economic and Socio-cultural importance. As they say “where there are trees, there is life”, plant compositions of any stand contribute life matters to everybody. An Asian proverb says “trees give shadow even for an axe man”. That means trees are life important for other living things and provide oxygen, shelter, food, fodder, useful materials, medicine, balance water regime, keep ecological equilibrium of the Earth and socio-cultural aspects for various sectors, institutions and organization. Although the importance of Churchyard forests is not described and understood yet, the researcher decided to conduct the study on the Socio-cultural significance of tree compositions of five Ethiopian Orthodox Churches at Addis Ababa. The study strongly focuses on the importance of trees to stabilize climatic changes and predicted sustainability in the geographical spread of describing the variety of life. Ethiopian Orthodox Church plant compositions or forest ecosystems stabilize and make the environment suitable and comfortable for all including church clerks, believers who use for worshiping, students to read or study, writers, elders to get rest and animals (birds and others). Economically, the plants are useful for any purpose likewise forest trees such as for timber production, edible fruits and fuel energy.

Socio-cultural Importance of Churchyard plant/forest composition was not studied yet.

During exploration of five ancient Churches, the researcher observed that Orthodox Church yards were occupied with indigenous as well as introduced species of trees different from other religious areas. Therefore, the researchers decided to conduct a study on the Socio-cultural Importance of Orthodox Church Yard plant trees ecosystems in five situational selected Churches found in Addis Ababa.

1.3. Objectives of the study

1.3.1 General objectives

The major objective of the study was to assess. Socio-cultural Importance of Orthodox Church Yard Plant Trees Composition Ecosystems.

1.3.2. The specific objectives

The specific objectives of the study are to:

1. Assess the socio-cultural importance of Orthodox Church Yard Plant Trees ecosystems
2. Explore the contribution of the Orthodox Church Yard Plant Trees ecosystems
3. Recommend on how to extend and handle church Plant Trees ecosystems

1.4. Research questions

1. What Socio-cultural importance of Orthodox Church Yard Plants Trees?
2. Is/was Trees seedling planting part of the plan during church planning?

1.5. Limitation of the study

Because of COVID-19 conducting focus group discussions was not possible and even individual interviewees show less interest to give information for fear of the same. The study participants assume sacred church information must be hidden to keep the holy place secret.

1.6. Delimitation of the Study

The study is geographically delimited into Addis Ababa selected five Orthodox Church compounds.

1.7. Significance of the study

- The study finding was utilized in mobilizing resources to scale up the plantation project
- The study was significant in providing primary data to researchers in academic institutions the church and the researcher acquires knowledge on the research topic.

1.8. Organization of the study

The study comprises of chapter one which was the introduction, chapter two which was literature review, chapter three was the materials and methods, chapter four consists of results and discussions and chapter five consisted of conclusion and recommendations .

Chapter two

2. Review of Related Literatures

2.1. Christianity and the church yard

The Bible commands us to creation care and forest protection from Genesis, the first book, to the Revelation, apparently the last book. The Book of Genesis opens the Bible with the story of creation. The Holy Bible in the Book of Revelation is strong in its language on the forests that it demands us to "Hurt not the earth, neither the seas nor the trees" (Revelation 7:3). Because we are created in the image of God and given responsibility to act toward creation as He commands, we must take a lesson and also plan for future generations. Therefore, it is unjust to deprive future generations of the experience and benefits of healthy forest ecosystems for current short-sighted exploitive practices. Just as the Earth is the Lord's, so are all the creatures and systems in it. The forests belong first to God. We are to steward the earth and the forests. The quality of our stewardship affects the quality of our lives. The creatures of the forest speak to us of God (Job 12:7-10) and they are given to us by God to direct our attention toward our God. A depreciated forest cannot fulfill God's intent for it, and our degradation of it insults God (Abate Gobena, 2018). The possible reasons why EOTC achieved the conservation of forest biodiversity can be expressed as (Abate Gobena, 2018).

There are four basic sequential steps in defining a forest statistical design: (i) Define the population of interest (ii) Define the sampling frame, the list of the elements in the population (iii) Define a sampling design (or sampling method); the sample design identifies how elements from the sampling frame will be drawn (iv) Identify the appropriate estimators given the sampling design (design-based estimators). These steps are relevant, regardless of whether a portion of the population is being sampled, the entire population is observed (census), or there is an assumed census (for example, using aggregate administrative data) (Laura Monopoli, 2018).

The sacred grounds of most of these ancient churches and monasteries contain natural forest vegetation rich in biodiversity which constitute important habitats and remained as the last remnant forest patches and biodiversity habitats for many centuries (Abate Gobena, 2018).

The Church, through its theological teaching and traditional practices entrenched on the Sacred Scriptures (*kidusatmetsaheft*) - including the Holy Bible, the Acts and Hagiographies

of Saints (*gedlekidusan*) - contribute for the survival and maintenance of those ancient forest remnants and biodiversity habitats. This research aimed at exploring how the theological reasoning and traditional practices of EOTC helped for the survival of ancient remnants of forest biodiversity in churchyards and monastery compounds as islands of rich and indigenous biodiversity in a sea of deforested landscape. The study will identify EOTC's teachings and practices related to forest conservation and discern their relevance as a response to the current problem of biodiversity degradation, hence, their significance to the national conservation policy and strategy (Abate Gobena, 2018).

Churchyards and monastery compounds are regarded as place of meditation and prayers, with very little or no other activities which may distract prayers and meditation. The Saints preferred to live solitary life in the wilderness of monasteries as an anchorite, hermit or coenobite. Melchezedek, Moses, Elijah can be referred from the pre-Christian or Old Testament times; and St John the Baptist, St Anthony, St Simon the Stylite from the Christian or New Testament ascetics (Abate Gobena, 2018).

Churchyards and monastery compounds are analogous to the Bible's Garden of Eden, sanctuary of life, in the mind of most Ethiopian Orthodox Christians. Anything within the churchyard and monastery compound is to be kept as it is and not to be altered. Such sanctuary thinking of the church is so dominant tradition any tree or shrub is to be kept untouched and left to grow and multiply, and when it dies for various reasons, it will be left to decompose. This has been one of the most important reasons accounted for the preservation and conservation of ancient forests of indigenous species (Abate Gobena, 2018).

Due to the religious and social responsibilities of EOTC to the nation, which is developed through centuries of intertwined relationship between the Church and the nation, the Church, hence, is considered as the custodian of the country's very important heritages including the environmental. Moreover, the Church is aware of this expectation from the community, and the clergy or ecclesiastical officials always consider themselves as responsible not only to the faith but also the social-cultural matters of the society; and act in line with this expectations (Abate Gobena, 2018).

According to Abate, the possible reasons why EOTC achieved the conservation of forest biodiversity can be expressed as:

- (i) Churchyards and monastery compounds are regarded as place of meditation and prayers, with very little or no other activities which may distract prayers and meditation. The Saints preferred to live solitary life in the wilderness of monasteries as an anchorite, hermit or cenobite. Melchezedek, Moses, Elijah can be referred from the pre-Christian or Old Testament times; and St John the Baptist, St Anthony, St Simon the Stylite from the Christian or New Testament ascetics (Abate Gobena, 2018).
- (ii) Churchyards and monastery compounds are analogous to the Bible's Garden of Eden, sanctuary of life, in the mind of most Ethiopian Orthodox Christians. Anything within the churchyard and monastery compound is to be kept as it is and not to be altered. Such sanctuary thinking of the church is so dominant tradition any tree or shrub is to be kept untouched and left to grow and multiply, and when it dies for various reasons, it will be left to decompose. This has been one of the most important reasons accounted for the preservation and conservation of ancient forests of indigenous species (Abate Gobena, 2018).
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2.2. Empirical Evidences

Ethiopia possesses one of the richest floras in Africa. Much of this floristic wealth is reflected in the fact that Ethiopia is one of the Vavilov's centres of origin and/or diversity for many domesticated plants and their wild relatives. This allowed the country to home for about 6603 species of vascular plants, of which 15.1% are endemic and 4.9% of Ethiopia is designated for protection. The total number of species of woody plants is estimated to be 1000 out of which about 300 are tree species. There are 968 indigenous woody species of Ethiopia so far out of which 28 tree species, 31 shrub species and 2 liana species are endemic. These woody

species are represented in 82 families and 320 genera (Abate Gobena, 2018).Based on the census report of the Central Statistical Agency of Ethiopia (2010), about 63% of the total population of Ethiopia is identified as Christian, of which over 70% are Orthodox Christians (Abate Gobena, 2018).The EOC forest conservation and management back date to Biblical times. The EOC tradition is that forests are the blanket and beauty of the earth. The practice of setting the church building on upper top of the land that is not arable to grow food open an opportunity to grow densely forests and trees. This practice and tradition was comes from the times of Eden, the Biblical fact. The EOC has depth of Biblical reason that under laying principle often considered and practiced by Ethiopian Orthodox Tewahido Church in nature conservation. Therefore, incorporating this best practice in biodiversity management and mountain conservation policy formulation is win-win scenario (Tulu Tolla Tura et al, 2017). In Ethiopia, natural forests and woodlands cover only 12.3 million hectares, of which the remaining closed natural forests are 4.12 million hectares or 3.37%. Between 1990 and 2005, Ethiopia lost over 2 million ha of its forests with an average annual loss of 140,000 ha. amidst of the successive wave of deforestation and depletion, however, unique and valuable natural forest remnants survived in and around churchyards and monasteries of the Ethiopian Orthodox Tewahido Church (EOTC) (Abate Gobena, 2018).

The Ethiopian Orthodox Church is considered champion of forestry in the country. “The church has been effectively managing surrounding environments for a long time by using its own religious justifications. Priests of the Orthodox Church have been ensuring that forests stay healthy in close to 35,000 churches and monasteries which cover 75 percent of the forests in Ethiopia (Wubalem Tadesse, Orthodox Church Described Model in Forest Management, 2019).

The Holy Bible states about Eden as “And the Lord God planted a garden east-ward in Eden; and there he puts the man whom he had formed. And out of the ground made the lord God to grow every tree that is pleasant to the sight, and good for food...And a river went out of Eden to water the Garden; and from thence it was parted, and became in to four heads. ” (Genesis 2: 8-10). Because mountains are symbolize the strength and stability, sources of strength, strength of the kingdom of God, the righteousness of God, persons in authority, difficulties (Tulu Tolla Tura et al, 2017).

Hence, therefore, the study was to examine economic, socio cultural, ecologic impacts in its microclimate of the church premises.

protection systems, conservation and management including integrated natural resources management with emphasis on ecologically sensitive zones and in arid regions, semi-arid regions, wetlands, and mangroves (ii) biologically and culturally valuable and

At a time when concern was increasing about the loss of such variety (Charles Kiprono Koech, 2018).

Important ecosystems, habitats, and species that are not already adequately protected (Japan International Cooperation Agency (JICA), 2013) and (www.gsars.org, 2018).

(2) Economic perspective: (i) utilization and economic profitability of forest, wildlife, and land conservation areas and (ii) role and involvement of private user, local community, and cooperative for rational management and use of forest resources, wildlife, and conservation areas (Japan International Cooperation Agency (JICA), 2013) and (www.gsars.org, 2018) was not described in the churchyards.

(3) Social perspective: (i) involvement and full participation of local communities, civil society, and citizens, as direct actors in the protection, conservation, and rational use of forest resources, wildlife, and conservation areas and (ii) protection, conservation, management, and use of forests, wildlife, and conservation areas (Japan International Cooperation Agency (JICA), 2013) and (www.gsars.org, 2018) also not understood in the church yards.

According to “Peter Klepeis” and others, protection of forests because of their association with religious traditions is a worldwide phenomenon.

These sacred forests play a key role in maintaining ecosystem services in regions affected by land system change.

In Ethiopian Orthodox Tewahido Church controls the majority of the surviving native forest. However, the reasons why communities value the forests and the ways they use and manage them are not well understood. Church forests represent an unusual form of community-based protection that integrates locally controlled common property with external institutional arrangements: this hybrid system is highly effective at protecting the forest while maintaining cultural practices.

According to “Peter Klepeis”, “theoretical debates about models of tropical forest protection and question assumptions about church forests being the product of nature conservation imperative” (Peter Klepeis, 2016).

The study conducted by Abiyou and his friends found that the local community respects and protects church forests and considers the church as a central institution and platform. However, the community is not strongly committed to adopt forest management culture of the church due to: 1) The church leaders didn’t teach more to their followers to plant trees and to transfer the knowledge; 2) Limited knowledge of the community about the benefits of forests to their livelihood.

3) In general, forests conserved by EOTC and its tradition provide an opportunity to establish insitu and exsitu conservation sites for forest resources (Abiyou Tilahun, 2015).

Chapter three

3. Research methodology

3.1. The Study Site

The study was conducted on plant Trees compositions and ecosystems of five Ethiopian Orthodox Churches at Addis Ababa.

Although more than 314 Orthodox Churches are found in Addis Ababa, only five Orthodox Christian Churches older than 50 years including the St Marry of Entoto, the St. Gabriel at Palace, the St. George of Arada, the St. Marry of Beata and the Holy Trinity-Cathedral were selected for the study.

3.2. Research design

Field-based study was applied to assess the ecological, economic and socio-cultural importance of 5 Orthodox Church Yard Plant ecosystems selected through situational sampling methods.

Descriptive, explanatory conclusion methods were used for data evaluation whereby both qualitative and quantitative methods of study were used to all five churches.

Data was on each church yard plant composition was collected using observation checklists and digital camera to take pictures and interviews with 50 (10 from each) church nuns, priests, deacons.

3.3. Data collection tools

3.3.1. Observation

Data on all selected five ancient Orthodox Churches yards composing plant/trees and ecosystems were collected through observation checklists and recorded in tables.

3.3.2. Interviews

Interviews were made with 50 (10 individuals from each church) nuns, priests and deacons on the importance of church yard plants and provided responses were recorded.

3.3.3. Digital Camera

All pictures of each were taking using mobile phone digital camera and transferred to computer data.

3.4. Data sampling techniques

Data sampling was made using situation sampling or based on the age of the churches that only 5 ancient churches aging more than 50 years were selected.

Table 1 Lists of selected Churches and sampled respondents

Name of Churches	Established	Selected respondents	Actual respondents
St. Beata Mariam	1879	10	3
St. Mariam (Entoto)	1870	10	4
St. Georges (Arada)	1894	10	7
St. Gabriel (Palace)	1889	10	4
The Holy Trinity Cathedral	1936	10	8
Total		50	26

Chapter four

4. Data presentation and Evaluation

4.1. Data display

4.1.1. Data collected through observation

4.1.1.1. St. Beata Mariam Church yard plants/trees composition observation

The Church Beata Mariam yard composes of 301 high trees and more than hundreds of shrubs, but the researcher omitted counting herbs and grassy species.



Figure 1 St Beata Mariam Church yard

Photo by Tigist Nigusie (2020)

Table 2 St. Beata Mariam Church yard plants/ trees composition

Vernacular names	Scientific names	Quantity
Tid	<i>Juniperus procera</i>	129
Shewashuwe(Arzelibanose)	<i>Casuarina equisetifolia</i>	18
Yeferenj Tid	<i>Cyperus lustranica</i>	21
Zigba	<i>Podocarpus falcatus</i>	4
Grar	<i>Acacia abyssinica</i>	36
Zenbaba	<i>Phoenix reclinata</i>	18
Girawa	<i>Vernonia amygdalina</i>	10
Mota	<i>Dracenia stedneuri</i>	12
Warka	<i>Ficus vasta</i>	5
Dokma	<i>Syzigium guinees</i>	5
Wanza	<i>Cordia africana</i>	17
Bisana	<i>Croton macrostachys</i>	11
Qundo Berberie	<i>Schinus molle</i>	10
Birbira	<i>Millettia ferruginea</i>	2
Roman	<i>Panica romantica</i>	3
Qey Bahr-Zaf	<i>Eucalyptus cameldulisis</i>	30
Korch	<i>Eritrina brucei</i>	10
Total		301

The study respondents described the St. Beata Mariam Church age more than 100years the importance of trees (plants) in a church is a place of realm and contemplation for high spiritual benefits the church planted on the top views for good view screen. Biblical teaching like Jesus Crist did, symbolic representation for mount Tsion. The criteria to plan church is the extent of congregation the tree seedling planting is part of the plan during church planning, No the church trees was wild plants trees planted in church premise was for church service and respect it is clothing for the church ,prayer, quite time medicine shelter the purpose of planting trees is the church is symbolic representation of the heaven and where by the holy canon dewells,God given place for forgiveness ,beautification of church environment the types of trees planted in church compound are long age trees that can resist heavy wind, drought and have long root in church compound Tid (*Juniperousprocera*), Weyra (*Oleauropea*) ,wanza (*CordiaAfricana*). Zigiba (*Podocarpusfalcatus*). Narcotic psychotropic plants are not grown in church compound. The Church has seat for the people, the number of trees reduced from time to time the conifer trees are higher in number. The trees serve as source of clean and cool air, source of herbal medicine reduced disease prevalence and

medical expenses people gather under the trees fresh air shed to celebrate holyday, to pray, to calm down when feel bad, to take a break serve as a Park and it also provide multiples benefits and shelter for wild animals. The researcher evaluated that even though there was no document of trees and their number, there is no seedling planting in a every year the practice of conserving trees make the church compound better comparing to the other.

St. Mariam Church of Entoto yard Plants/trees composition

4.1. 2. St. Mariam Church of Entoto plants /trees composition observation

St. Mariam yard has 490 trees and more than Hundreds of shrubs where by the researcher omitted counting herbs and other grassy plants



St.Mariam church of Entoto Yard

Figure 2 St. Mariam Church of Photo by Tigist Nigussie (2020)

Table 3 St. Mariam Church of Entoto yard plants/trees composition

Vernacular names	Scientific names	Quantity
Tid	<i>Juniperus procera</i>	159
Yeferenj tid	<i>Cyperus lustanica</i>	100
Woiera	<i>Olea europea</i>	80
Lol	<i>Ekeber giacapensis</i>	4
Tikur-enchet	<i>Prunus africana</i>	2
Nech Bahar-Zaf	<i>Eucalyptus globulus</i>	126
korch	<i>Eritrina brucei</i>	10
Zembaba	<i>Hyphaene thebaica</i>	1
Koso	<i>Hygenia abyssinica</i>	1
Warka	<i>Vicus alba</i>	3
Total		490

The study respondents described the St. Entoto Mariam Church age more than 100 years. The importance of trees (plants) in a church is a place of realm and contemplation for high spiritual benefits. The church planted on the top views for good view screen. Biblical teaching like Jesus Christ did symbolic representation for Mount Zion. The criteria to plan church is the extent of congregation. The tree seedling planting is part of the plan during church planning. No wild plants trees planted in church premise was for church service and respect. It is clothing for the church, prayer, quiet time, medicine, shelter. The purpose of planting trees in the church is symbolic representation of the heaven and where by the holy canon dwells, God given place for forgiveness, beautification of church environment. The types of trees planted in church compound are long age trees that can resist heavy wind, drought and have long root in church compound. Tid (*Junipers procera*), Woiera (*Olea europea*), wanza (*Cordia africana*), Zigiba (*Podocarpus falcatus*). Narcotic psychotropic plants are not grown in church compound. The Church has seat for the people. Cemeteries have trees. The number of trees reduced from time to time. The conifer trees are higher in number. The trees serve as source of clean and cool air, source of herbal medicine, reduced disease prevalence and medical expenses. People gather under the trees, fresh air, shed to celebrate holyday, to pray, to calm down when feel bad, to take a break, serve as a Park and it also provide multiples benefits and shelter for wild animals. The researcher evaluated that even though there was no document of trees and their number, there is no seedling planting in a every year. The practice of conserving trees make the church compound better comparing to the other.

St. Georgis church (Arada) plants/trees composition

4.1.3. St. Georgis church (Arada) plants/trees composition observation

St. Georgis has 425 varied high trees and more than hundreds of shrubs /herbs where by the researcher omitted counting herbs and other grassy plants



Figure 3 St. Georges (Arada) Church yard

Table 4 St. Georges (Arada) Church plants/trees composition

Vernacular names	Scientific names	Quantity
Tid	<i>Juniperus procera</i>	200
Yeferenje Tid	<i>Cyperus lustranica</i>	120
Arzelibanose	<i>Causarina cunning hamiana</i>	2
Woiera	<i>Olea africana</i>	105
Birbira	<i>Millettia ferruginea</i>	2
Mota	<i>Dracaena steudent</i>	20
Roman	<i>Panica romantica</i>	1
Indode	<i>Phytolacca dodecandra</i>	4
Beles	<i>Ficus carica</i>	2
Zigba	<i>Podocarpus falcatus</i>	10
Wanza	<i>Cordia africana</i>	10
Dokma	<i>Syzygium guineense</i>	7
Bisana	<i>Croton macrotachys</i>	5
Shola	<i>Ficus sur</i>	1
Zembaba	<i>Phonix reclinata</i>	10
Enjori	<i>Rubus apetalus</i>	1
Kundoberbere	<i>Schinus molle</i>	2
Girawa	<i>Vernonia amygdlina</i>	4
Lol	<i>Ekebergia capensis</i>	1
Warka	<i>Ficus vasta</i>	1
Tikurenchet	<i>Prunus africanus</i>	7
Bottle Brush	<i>Callistemencitrinu</i>	1
Nech Bhar-Zaf	<i>Eucalyptus globulus</i>	10
Mota	<i>Dracaena steudent</i>	1
Chibeha	<i>Ficus thonningii</i>	424

St. Georges (Arada) Church Herbs which have medicinal value were Kelwa

(Maesalanceolata), Tult (Rumexsteudelii), Telenge (Achyranthusaspera), WoyinAgift

(Haemanthus multiflorus), *Getem (Scheffera abyssinica)*, *Eret (Aloe vera)*, *Anzerzye (Gladdious pistacinus)*, *Demabedari (Dicliptera laxata)*, *Ameraro (Discopodium penninervum)*, *Misrich (Celeodendrum myricodes)*, *Embuacho (Rumxnervosus)*, *Demekese (Ocimum urticifolium)*, *Ensilal (Foeniculum vulgare)*, *Sirebizu (Thalictrum rhynchopeta)*, *Achut (Verbena officinalis)*.

Study respondents described the St. Georges (Arada) Church age more than 100 years the importance of trees (plants) in a church is a place of realm and contemplation for high spiritual benefits the church planted on the top views for good view screen. Biblical teaching like Jesus Christ did symbolic representation for Mount Zion. The criteria to plan church is the extent of congregation the tree seedling planting is part of the plan during church planning no the church trees was wild plants trees planted in church premise was for church service and respect it is clothing for the church, prayer, quiet time medicine shelter the purpose of planting trees is the church is symbolic representation of the heaven and where by the holy canon dwells, God given place for forgiveness, beautification of church environment. The types of trees planted in church compound are long age trees that can resist heavy wind, drought and have long root in church compound Tid (*Juniperus procera*), Woiera (*Olea europea*) wanza (*Cordia africana*). Zigiba. (*Podocarpus falcatus*). Narcotic psychotropic plants are not grown in church compound. The Church has seat for the people, Cemeteries have trees the number of trees reduced from time to time the conifer trees are higher in number. The trees serve as source of clean and cool air, source of herbal medicine reduced disease prevalence and medical expenses people gather under the trees fresh air shed to celebrate holyday, to pray, to calm down when feel bad, to take a break serve as a Park, and it also provide multiples benefits and shelter for wild animals. The researcher evaluated that even though there was no document of trees and their number, there is no seedling planting in an every year the practice of conserving trees make the church compound better comparing to the other.

St.Gabreil Church (palace) plants/Trees composition

4.1.4. St. Gabreil Church (Palace) plants /Trees composition Observation

St.Gabreil (palace) yards has 80 trees



Figure 4 St Gabriel Church yard

Table 5 St Gabriel Church Plants/Trees composition

Vernacular name	Scientific name	Quantity
Tid	<i>Juniperus procera</i>	47
woiera	<i>Olaeuropea</i>	16
Nech Bahar-Zaf	<i>Eucalyptus globulus</i>	10
Warka	<i>Ficus vasta</i>	3
Birbra	<i>MillettiaFerrugia</i>	1
Wanza	<i>Cordia Africana</i>	3
Total		80

Study respondents described the St. Gabriel (palace) Church age more than 100years the importance of trees (plants) in a church is a place of realm and contemplation for high spiritual benefits the church planted on the top views for good view screen. Biblical teaching like Jesus Crist did symbolic representation for mount Tsion. The criteria to plan church is the extent of congregation the tree seedling planting is part of the plan during church planning the church trees was no wild plants trees planted in church premise was for church service and respect it is clothing for the church ,prayer, quite time medicine shelter the purpose of planting trees is the church is symbolic representation of the heaven and where by the holy canon dewells, God given place for forgiveness ,beautification of church environment the types of trees planted in church compound are long age trees that can resist heavy wind, drought and have long root in church compound Tid (*Juniperousprocera*),

Weyra(Olea europea) ,wanza(Cordia Africana). Zigiba (Podocarpus falcatus). Narcotic psychotropic plants are not grown in church compound. The Church has seat for the people, the number of trees reduced from time to time the conifer trees are higher in number. The trees serve as source of clean and cool air, source of herbal medicine reduced disease prevalence and medical expenses people gather under the trees fresh air shed to celebrate holyday, to pray, to calm down when feel bad, to take a break serve as a Park and it also provide multiples benefits and shelter for wild animals. The researcher evaluated that even though there was no document of trees and their number, there is no seedling planting in a every year the practice of conserving trees make the church compound better comparing to the other.

St. Gabriel church of respondent through interview responded Seedling planting was part of the plan during church establishment seedling planting takes place before and after set the church trees gave the church grace and respect. The aim of planting trees has many uses to get fresh air for medicine, for washing smoking to remove bad sprit to make holy oil (kiba kidus) and for medicine. The types of trees planted in church were had longer age can resist wind, drought, and plants like narcotic was not planted in church majority of trees observed were coniferous and olive.

Holy Trinity Cathedral Church plants/Trees composition

4.1.5. Holy Trinity Cathedral Church plants/trees composition observation

The church Holy Trinity Cathedral yard has 491 high trees and more than hundreds of shrubs where by the researcher omitted counting herbs and other grassy plants



Figure 5 Holy-Trinity Church yards

Table 6 a Holy Trinity Cathedral church plants/trees composition

Vernacular names	Scientific names	Quantity
Tid	<i>Juniperus procera</i>	212
YeferenjeTid	<i>Cyperus lustanica</i>	108
Woiera	<i>Olea europea</i>	78
Zenbaba	<i>Phoenix reclinata</i>	5
Bisana	<i>Croton macrostachys</i>	8
Gravilia	<i>Grevillea robusta</i>	5
Beles	<i>Ficus carica</i>	2
Bahirzaf	<i>Eucalyptus globulus</i>	11
Abukado	<i>Persea Americana</i>	1
Shewshwe	<i>Casuarina cunning hamiana</i>	5
Injorie	<i>Rubus steudner</i>	1
Mota	<i>Dracaena steudent</i>	10
Roman	<i>Punica granatum</i> L.Roman	1
Cazmir	<i>Casmiroa edulis</i>	1
Kundoberbere	<i>Schinus molle</i>	1
Dokma	<i>Syzygium guineense</i>	1
Wanza	<i>Cordia Africana</i>	3
Indod	<i>Phytolacca dodecandra</i>	1
Lol	<i>Ekebergia capensis</i>	2
Birbira	<i>Millettia ferruginea</i>	1
Mota	<i>Dracaena steudent</i>	2
Girar	<i>Acacia abyssinca</i>	10
Girawa	<i>Vernonia amygdalina</i>	3
Korch	<i>Eritrinabruce</i>	5
Arzelibanose	<i>Causarina cunning hamiana</i>	4
Tikurenchet	<i>Prunus africanus</i>	6
total		486

Study respondents described Holy Trinity Church age more than 50 years the importance of trees (plants) in a church is a place of realm and contemplation for high spiritual benefits the church planted on the top views for good view screen. Biblical teaching like Jesus Crist did, symbolic representation for mount Tsion.the criteria to plan church is the extent of congregation the tree seedling planting is part of the plan during church planning no the church trees was wild plants trees planted in church premise was for church service and respect it is clothing for the church ,prayer, quite time medicine shelter. The purpose of planting trees is the church is symbolic representation of the heaven and where by the holy canon dewells,God given place for forgiveness ,beautification of church environment. The types of trees planted in church compound are long age trees that can resist heavy wind, drought and have long root Tid(*Juniperousprocera*),Woiera(*Oleaeuropea*) ,wanza(*Cordia*

Africana). *Zigiba (Podocarpus falcatus)*. Narcotic psychotropic plants are not grown in church compound. The Church has seat for the people, Cemeteries have trees the number of trees reduced from time to time the conifer trees are higher in number the trees serve as source of clean and cool air, source of herbal medicine reduced disease prevalence and medical expenses people gather under the trees fresh air shed to celebrate holyday, to pray, to calm down when feel bad, to take a break serve as a Park and it also provide multiples benefits and shelter for wild animals. The researcher evaluated that even though there was no document of trees and their number, there is no seedling planting in an every year the practice of conserving trees make the church compound better comparing to the other.

4.2. Data collected through interview questions

Respondent's opinions on types of trees/plant Table 6 shows that out of 50 sampled study respondents only 26 were willing to respond which 52% was. The churches aged more than 100 years which was equivalent to the establishment of Addis Ababa city.

Table 7 Response rate

Name of Churches	Years of establishment	Selected respondent	Actual respondent
St.Mariam(Beata)church plant/ trees	1879	10	4
St.Mariam(entoto)church plant/ trees	1870	10	4
Church-Georges (Arada) plants/trees	1894	10	7
St.Gabriel(Palace)church plants/trees	1889	10	3
Church- Trinity-cathedral plants/trees	1936	10	8
Total		50	26

The majority of study respondents responded that the age of the churches were longer age 7(26.9%), the study respondents were seen in the church compound and are priests, nuns, deacons, which accounts 24(96.2%).

4.2.1. Economic importance

The economic importance of the church plants. According to the respondents study participants consider the importance of plants in a church as place of realm and contemplation for high level spiritual benefits. The study respondents described the Church was the symbolic representation of the heaven and where the holy canon dwells, God given place for forgiveness 25(96.2%).

In fact some of them described its importance as tourism industries and timber uses. For example, Wanza tree will be used for timber, which accounts 22 (84.6%). Even though it has

economic importance narcotic or psychotropic plants and short life trees are not grown in the church compound.

4.2.2. Ecologic importance

The tree seedling planting was part of the plan during the church planting, 25(96.2%). Trees were planted to respect the church environment 22(84.6%), It is the clothing for the church, prayer, quiet time, medicine 2(7.7%), shelter 2(7.7%) , long age trees that can resist drought and have longer roots olive tree, *Cordia africana*, *Podocarpus falcatus* 22(84.6%).

4.2.3. Socio-cultural importance

The church and the environment a church as place of realm and contemplation for high level spiritual benefits.. The Church has seat for the people, Cemeteries have trees .the trees serve as source of clean and cool air, source of herbal medicine reduced disease prevalence and medical expenses people gather under the trees fresh air shed to celebrate holyday, to pray ,to calm down when feel bad, to take a break The study respondents were asked if the number of trees were reducing or not and 25 (96.2%) responded that it was reducing from time to time, but the church environment is better compared to other environments. The majority of trees observed in the church compound were Ethiopian conifer-Tid which accounts 26 (100%).In facts some of them described its importance as tourism industries common trees which were found in all five churches.

These were;

- Common trees in all churches are olive trees and Juniperous trees
- Olive trees (*Olea* European) are common their stick smoke used as disinfect pots(vessels) or materials, to destroy bad or evil spirit olive oil called kibakidus
- Used to bless church establishment in all direction, to bless the holly water during baptism
- Of infants and used as medicine for different disease example for ear disease.
- Juniper *procera* (East African pencil cedar) big joint trees one of the trees used to make the Cross and made cross on which Jesus was scarified. It is blessed used to make wooden cross, for construction of new churches when they are plenty before civilization and holly men living and praying in it.

4.3. Data analysis and evaluation

According to the key informant interviewees ecological, economic and socio cultural importance of trees were described-trees serve as sources of clean and cool air and were able resist drought and heavy wind in the church compound and reputation to the church environment, reduce disease prevalence such as malaria, serve as source of herbal medicine and reduce medical expenses, people gather under church trees fresh air shed to celebrate holidays, to pray ,to calm down when feel bad and people take a break under it, it also provide multiple benefits and shelter for wild animals.

Chapter five

5. Summary, Conclusions and Recommendations

5.1. Summary

The study was conducted to assess Socio-cultural Importance of Orthodox Church Yard Plants: the case selected Churches found in Addis Ababa. It was to assess Socio-cultural Importance of Orthodox Church Yard Plants.

In this study the Socio-cultural importance of Orthodox Church Yard Plants in Addis Ababa was considered. Cross sectional study was conducted to describe the conservation management made in each Church.

Material and methods were Digital camera was used to take photos of churchyards, trees and other basic features. Interview checklist was also used. Observation and photo taking were made. In each church interview of people was conducted. And observations showed that there were common trees which were found in all five churches.

These were;

- Common trees in all churches are olive trees and Juniperous trees
- Olive trees (Olea European) are common their stick smoke used as disinfect pots(vessels) or materials, to destroy bad or evil spirit olive oil called kibakidus
- Used to bless church establishment in all direction, to bless the holly water during baptism
- Of infants and used as medicine for different disease example for ear disease.
- Juniper procera (East African pencil cedar) big joint trees one of the trees used to make the Cross and made cross on which Jesus was scarified. It is blessed used to make wooden cross, for construction of new churches when they are plenty before civilization and holly men living and praying in it.

5.2. Conclusions

Ecological Importance of Orthodox Church Yard Plants: Ecological, importance of trees were described-trees serve as sources of clean and cool air and were able resist drought and heavy wind in the church compound and reputation to the church environment, reduce disease prevalence such as malaria, serve as source of herbal medicine and reduce medical expenses, people gather under church trees fresh air shed to celebrate holidays, people take a break under it, it also provide multiple benefits and shelter for wild animals.

Economic Importance of Orthodox Church Yard Plants: Economic importance of trees were described-trees serve as sources of clean and cool air and were able resist drought and heavy wind in the church compound and reputation to the church environment, reduce disease prevalence such as malaria, serve as source of herbal medicine and reduce medical expenses, people gather under church trees fresh air shed to celebrate holidays, people take a break under it, it also provide multiple benefits and shelter for wild animals.

Socio-cultural Importance of Orthodox Church Yard Plants: Socio cultural importance of trees were described-trees serve as sources of clean and cool air and were able resist drought and heavy wind in the church compound and reputation to the church environment, reduce disease prevalence such as malaria, serve as source of herbal medicine and reduce medical expenses, people gather under church trees fresh air shed to celebrate holidays, people take a break under it, it also provide multiple benefits and shelter for wild animals.

The Ethiopian Tewahido church was contributing to the microclimate church environment and the city too. Government and other community even, individuals and others can learn a lot from this best practice.

Ethiopian Orthodox Church is a pioneer church in Ethiopia that practiced forest conservation in the church yard before modern natural resources conservation theory was formulated.

2.3. Recommendations

The Ecological aspect

Tree seedling planting was part of the plan during the church planting. Trees were planted to respect the church environment. It was the clothing for the church, prayer, quite time, medicine, long age trees that can resist heavy wind, drought and have longer roots Tid (*Juniperus procera*), Woiera (*Olea europea*), wanza (*Cordia Africana*). Zigiba (*Podocarpus falcatus*).

The Social cultural aspect

The number of trees was reducing from time to time, but the church environment is better compared to other environments. The majority of trees observed in the church compound were Ethiopian Tid (*Junipers procera*)

The study participants consider the importance of plants in a church as place of realm and contemplation for high level spiritual benefits. The study respondents described the Church was the symbolic representation of the heaven and where the holy canon dwells, God given place for forgiveness.

In fact some of them described its importance as tourism industries and timber uses. For example, Wanza tree will be used for timber. Even though it has economic importance narcotic or psychotropic plants and short life trees are not grown in the church compound.

Other future research options:

The researcher unable to access records of trees and their ages, therefore, it was advisable that types of plants in the church compounds documented for easy references or available to researchers to access and use it.

Conduct research on contribution of church plants to micro and macroclimates conducted in a wider coverage;

Promote church contributions on the greening of the environment and the benefits it may have in spilling over the experience to nearby community;

Government and other community even, individual and others can learn a lot from this best practice.

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Appendix I. Demographic features of Respondents to interview

1. Interview

No	Questions		
1.1	Since when have you been her?, become part of this congregation		
1.2	What do you do her?		
1.3	How old are you?		
Sn	Questions		
2.1	Why is/was church planted on top views?		
2.2	What is/was the criteria to plant church?		
2.3	Is/ was tree seedling planting part of the plan during the church planning?	Yes =1	No=0
2.4	Is/was the tree planted before the church is planted?	Yes =1	No=0
2.5	Is/was the church trees wild plant?	Yes =1	No=0
2.6	Why was trees planted in the church premises?		
2.7	What is/was the purpose?		
2.8	What types of trees were/are planted?		
2.9	Why other types of trees are not planted?		

2. Observations

Sn	Questions		
3.1	Does the church have fencing?	Yes =1	No=0
3.2	Can you observe trees in the church compound	Yes =1	No=0
3.3	Does it have seats for people?	Yes =1	No=0
3.4	Do you observe cemeteries?	Yes =1	No=0
3.5	Does the cemetery have trees?	Yes =1	No=0
Sn	Questions		
3.6	Was the tree number higher in previous times?		
3.7	What are the types of trees you observed		
3.8	What types of trees are greater in number?		

3.9	What is their age?
3.10	What is the distance between the trees?
3.11	What is the number of trees now?

Appendix II: Some of church yard plants/ Trees composition.



