



MINISTRY OF HEALTH ETHIOPIA

**NATIONAL STRATEGIC ACTION PLAN
FOR EYE HEALTH
2016 - 2020**



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Acronyms

AAU-CHS	Addis Ababa University-College of Health Sciences
AMD	Age-Related Macular Degeneration
CS/NDCS	Non Doctor Cataract Surgeons
CBM	Christoffer Blinden Mission
CSC	Cataract Surgical Coverage
CSR	Cataract Surgical Rate
CHBLV	Childhood Blindness Low Vision
DR	Diabetic Retinopathy
FMOH	Federal Ministry of Health
FMOE	Federal Ministry of Education
FMHCACA	Food Medicine Health Care Administration, Control Authority
FHF	Fred Hollows Foundation
HEW	Health Extension Workers
HDI	Human development Index
HAD	Health Development Army
HReH	Human Resource for Eye Health
HSTP	Health Sector Transformation plan
HCP	Himalayan Cataract Project
ITI	International Trachoma Initiative
IAPB	International Agency for Prevention of Blindness
IECW	Integrated Eye Care Worker
INGDO	International Non -Government Development organizations
LFTW	Light For The World
MDA	Mass Drug Administration
NCD	Non communicable Disease
NCPB	National committee for Prevention of Blindness
NTD	Neglected Tropical Diseases
NTTC	National Taskforce for Trachoma Control
NOP	Neuro-Ophthalmology
PECU	Primary Eye care Units
PFSA	Pharmaceutical Fund Supplier Agency
PPV	Pars Plana Vitrectomy
RD	Retina Detachment
RE/URE	Refractive Error/Un corrected Refractive Error
SAFE	Surgery, Antibiotics, Face and Environmental sanitation
SECU	Secondary Eye Care Unit
SLM	Slit lamp Microscope
TECU	Tertiary Eye care Units
TT	Trachomatous Trichiasis
TCC	The Carter Center
VEGF	Vascular Endothelial Growth Factor
VAO	Vision Aid Overseas
WHA	World Health Assembly

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FOREWORD

The Federal Ministry of Health (FMOH) officially launched the VISION 2020, the Right to Sight Global Initiative, in Ethiopia on 18 September 2002 after developing a National Five-Year Comprehensive Strategic Plan for Eye Care. This document is the 4th Ethiopian strategic plan for eye health and blindness prevention. The plan will extend from 2015 to 2020 in line with the HSTP which in turn feeds into the country's greater GTP. The strategy is developed in cognizance of the WHA 62.1 recommendations and the WHO action plan for vision 2020. The strategy underlines the future economic and development gains to the nation as a whole in tackling the gruesome causes of visual impairment and blindness in all age and gender groups. It is noted that economic development and health are strongly intertwined with both.

The prevalence of blindness and visual impairment in Ethiopia is among the highest in the Sub-Saharan Africa. The current plan aims to change the status quo through high level of engagement and commitment across all decision makers and the Ethiopian community in general. Specifically, the plan includes Human Resource for eye health management as one of the strategic objectives that will realize equitable, rational development and distribution of eye care workers in line with VISION 2020.

The plan also addresses the issue of infrastructure improvement as a key tool in providing and improving quality service delivery. Furthermore, the FMOH will finance eye care as part of wider comprehensive health care system and will work towards availing eye health specific supplies, drugs, instruments and equipment. The eye care health information system will be harmonized across all stake holders and made as robust as possible to capture all relevant information that feeds into the National HMIS. In this strategy, research is given due emphasis as basis to make informed decisions. The most important aspect of the realization of this strategy is the leadership that will enhance harmonization, coordination and service quality assurance. The National committee for the Prevention of blindness (NCPB) will play this crucial role of technical guidance and leadership. The government will continue to provide overall leadership, governance and support especially in facilitating the development of policies and strategies for implementation. Partnership across all stakeholders will be embraced in order to have a participatory, realistic, comprehensive and sustainable eye health care program in Ethiopia.



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Executive Summary

Eye health care in Ethiopia has been coordinated for the past several decades under different umbrellas; and at the moment, eye care in the Federal Ministry of Health is being overseen under the Disease Prevention and Control Directorate within two teams, namely Non-Communicable Diseases and Neglected Tropical Disease. In the past years, the overall eye health agenda did not receive the desired attention from the government to address the multifaceted challenges. Especially around human resource development, according to the latest reports in 2015, there are over 130 general ophthalmologists including 20 sub-specialists level practicing in the country. Of those practicing ophthalmologists, around 60% reside in Addis Ababa and about 49% work either in the private or NGO sector. In addition, there are 210 optometrists, 58 cataract surgeons, 43 ophthalmic officers over 150 ophthalmic nurses and 560 integrated eye care workers (IECWs). The available number of professionals in Ethiopia is way below the internationally recommended levels of one ophthalmologist to 250,000, one optometrist to 50,000 people and one cataract surgeon to 250,000 people. The productivity is unacceptably low and geographic distribution of services is unfair, leaving the large majority of the rural Ethiopian population underserved. There are only 47 public secondary eye care units and 4 tertiary centers in the country. The ratio of ophthalmologists to population in Ethiopia is currently at 1:1.5 which is below the standard 1:0.25 million.

The 2006 national survey reported a prevalence rate of 1.6% and 3.7% for blindness and low vision, respectively. The high prevalence of visual impairment makes the country one of those countries with very high prevalence of blindness and visual impairment in the world. Cataract, trachoma, and refractive error were reported as the leading causes of blindness and low vision in the country accounting for 70% of all causes. Cataract as a cause of blindness contributes 49.9 %, followed by corneal opacities of all causes 19.3% and Refractive Error 7.8%. To address the predominant causes of blindness and visual impairment problem in Ethiopia, multiple inter-linked activities and interventions need to be undertaken by the Ethiopian government, community and other stakeholders. Some of the key activities will focus on governance and leadership, community participation and empowerment, human resource for eye health development, infrastructure (equipping and supplying and to some extent by constructing PECU/SECU in needy regions and places), partnership (with FMoH at all levels, ministry of education and Social Affairs offices, Academic institutions, WASH organizations, local/international INGO's and Civic societies), and monitoring and evaluation.

Chapter One: Background

1. Introduction

Ethiopia, located in the Horn of Africa, is a sub-Saharan African country with an estimated population of 94.1 million in 2015¹. About 85% of the population resides in rural areas. The population is predominately young with 47% under the age of 15 years. Population over 65 years accounts for only 3% of the total. While the sex ratio between male and female is almost equal, women in the reproductive age group constitute 24% of the population.² Ethiopia is a Federal Democratic Republic with nine national regional states and two city administrations. The regions are divided into administrative units: Zones, Woredas (districts), and villages known as Kebeles (the smallest administrative units consisting of 200 to 500 households each).

Ethiopia has shown an impressive double digit economic growth over the past ten years; however, according to 2014 UNDP report, Ethiopia's Human development Index (HDI) value for 2013 is 0.435 (which is in the low human development category) positioning the country at 173 out of 187 countries and territories. Between 2000 and 2013, Ethiopia's HDI value increased from 0.284 to 0.435, an increase of 53.2 percent. The literacy status of the population remains very low with adult literacy rate of 42.7% (50.3% for male and 35.1% for female)³

The country's health service delivery has adopted a three level system consisting of a primary hospital, health centers and satellite health posts to form the basis for primary health care unit (PHCU) in each Woreda. General and specialized hospitals form the secondary and tertiary levels respectively.

2. Epidemiology

According to WHO reports in 2014 GC, 285 million people are estimated to be visually impaired worldwide: 39 million are blind and 246 million have low vision. About 90% of the world's visually impaired live in low-income settings. Eighty-two percent of people living with blindness are aged 50 and above. Globally, uncorrected refractive errors are the main cause of moderate and severe visual impairment, and cataracts remain the leading cause of blindness in middle- and low-income countries. The number of people visually impaired from infectious diseases has reduced in the last 20 years according to global estimates. Eighty percent of all visual impairment can be prevented or cured.

1CSA projections, www.csa.gov.et/pop

2Demographic Health Survey (DHS), 2011

3 http://hdr.undp.org/sites/all/themes/hdr_theme/country-notes/ETH.pdf

About 65 % of all people who are visually impaired are aged 50 and older, while this age group comprises about 20 % of the world's population. With an increasing elderly population in many countries, more people will be at risk of visual impairment due to chronic eye diseases and ageing processes. An estimated 19 million children are visually impaired. Of these, 12 million children are visually impaired due to refractive errors, a condition that could be easily diagnosed and corrected. One million four hundred thousand are irreversibly blind and need visual rehabilitation interventions for a full psychological and personal development.⁴

Eye health problems, including blindness and visual impairment, are one of the major public health problems in Ethiopia, affecting over 15 million people. According to the 2006 National Survey on Blindness, Visual Impairment and Trachoma report, the national prevalence of blindness and visual impairment were estimated at 1.6% and 3.7% respectively. Which, in terms of people, translate into 1.3 million blind and additional 3.1 million people with visual impairment. Additionally, the survey revealed that over nine million children 1-9 years of age had active trachoma, and 1.5 million people aged 15 years and above had trichomatous trichiasis (TT) and are at risk for blindness unless operated on immediately. Cataract constitutes more than 49% of the total causes of blindness in the country. The 2005/6 national survey reported Cataract, Trachoma, and Refractive error as the leading causes of blindness and Visual impairment in the country. Cataract as cause of blindness contribute 49.9 %, followed by corneal opacities of all causes 19.3% and Refractive Error 7.8% .⁵ Table 1 summarizes the level of various causes of blindness and visual impairment and estimated number of people affected in 2012.

Furthermore, the Global Trachoma Mapping Project carried out in 2013 has shown that Ethiopia has the highest burden of blinding trachoma in the world with more than 76 million people living in trachoma endemic areas and around 800,000 individuals at risk of blindness due to TT⁶.

⁵ 2005/206 national survey

⁶ GTMP 2013, <http://www.trachomaatlas.org/maps/ethiopia>

Table 1. Causes of Blindness and Visual impairment in Ethiopia (Estimates based on the National Survey of 2006 and projected population of Ethiopia in 2014)

Disease /condition	Prevalence	Estimated number of people affected 2014
BLINDNESS	1.6%	1,440,000
Major Causes of blindness		
Cataract	49.9%	718,560
Trachoma	11.5%	165,600
Other corneal opacities	7.8%	112,320
Refractive Errors	7.8%	112,320
Glaucoma	5.2%	74,880
Other causes	17.8%	256,320
VISUAL IMPAIRMENT	3.7%	3,330,000
Major Causes of low vision		
Cataract	42.3%	1,408,590
Refractive Errors	33.4%	1,112,220
Trachoma	7.7%	256,410
Other causes	16.6%	552,780
Active trachoma (among children aged 1-9 years)	40.10%	9,589,057

3. Eye care in Ethiopia

3.1. Historical background

Eye care services have been provided for more than five decades in Ethiopia; however, an organized national program was only established within the FMOH in 1976. This program was known as “The Ethio-Italian Trachoma Project”, since the major support came from the Italian Government Development Cooperation. Ten years later in 1986, the Trachoma Project was elevated to the National Program for the Prevention of Blindness, which included all causes of blindness in the country. The Program functioned comprehensively for some years but was interrupted at a later time with unclear reasons. The National Committee for the Prevention of Blindness (NCPB) was then established in 1996 and it was restructured in 2000 in line with the global initiative VISION 2020: The Right to Sight.

The FMOH officially launched the VISION 2020: The Right to Sight Global Initiative in Ethiopia on 2002 after developing a National Five-Year Comprehensive Strategic Plan for Eye Care. The initiative has given momentum to the prevention of blindness worldwide in general and developing countries, like Ethiopia in particular. The World Health Assembly (WHA) has also passed a number of resolutions to eliminate avoidable (preventable and/or treatable) blindness by the year 2020, globally.

The National program for prevention of blindness (NPPB) was a centralized program up to 1993. Following restructuring of the health system in the country, the NPPB was reorganized as a Prevention of Blindness Team in 1994, under the Epidemiology and AIDs Department of the FMOH. In 2013, further restructuring was carried out within the FMOH and eye care is now being managed under the Non Communicable Diseases (NCDs) and Neglected Tropical Diseases (NTDs) programs within the Disease Prevention and Control Directorate of the FMOH. The National Committee for the Prevention of Blindness (NCPB) and the National Trachoma Task Force (NTTF) serve as national forums for the Ministry to engage all stakeholders for on-going collaboration, alignment, coordination, advocacy and resource mobilization for the prevention of blindness in Ethiopia.

The National Five-Year Strategic Plan for Eye Care in Ethiopia has been used as the main tool for the implementation of the Global Initiative VISION 2020: The Right to Sight. Prevention of blindness has been included in the Health Sector Development Programs (HSDP-II to HSDP IV) and well articulated on the latest health sector plan - Health Sector Transformation Plan (HSTP 2016-2020). Relative to the previous eye health strategic plans, the current revised eye health strategic plan is developed to better align with the Health Sector Transformation Plan (HSTP). Hence, this eye health strategic plan, as a subset of the national health plan, focuses mainly on highlighting eye health problems and what needs to be done to address issues of service expansion, integration into the general health care system, and quality of eye care services in the country.

3.2. Eye care service delivery status

The mid-term evaluation of the second National Five-Year Strategic Plan for Eye Care was conducted in 2010. The results showed that there were modest achievements in the development of essential human resources for eye care, infrastructure development, and in mass drug administration (MDA) for trachoma control. Compared to the planned targets, low performance was observed in the areas of cataract surgery, prevention and control of childhood blindness, and refractive error corrections. From 2001-2009, before the mid-term evaluation, 442,863 people were operated for Trachomatous Trichiasis, which was 55% of the target. The number of Woredas/Districts implementing the SAFE strategy for trachoma control increased from 3 in 2003 to 195 in 2010. The table below (table 2) outlines the number of eye care activities performed in 2012 by type of treatment and sex of patient.

During the same period, a National Survey on Blindness, Visual impairment and Trachoma, the first ever national survey, was conducted to obtain baseline data for planning, evaluation and advocacy for eye health. Guidelines, manuals and information, education and communication (IEC) materials were developed and distributed to regions and the wider stakeholder group. Partnership and eye care coordination activities were strengthened through the National Committee for the Prevention of Blindness and National Taskforce for Trachoma Control meetings, consultative workshops and review meetings.

Table 2. Eye Care Activities performed in 2012 by Type of Treatment and by Sex of Patients

REGION	Cataract Surgery		Other major surgery		TT surgery	Other Minor Surgery			Issued Prescription or eyeglasses	
	M	F	M	F	M	F	M	F	M	F
TIGRAY	7,339	7,197	29	11	11,918	18,032	...	...	796	319
AFAR	317	344	...	...	...	...	...	...	...	...
AMHARA	2,802	2,534	833	599	23,474	44,410	320	338	...	...
OROMIA	5,047	4,274	1,496	1,035	3,425	3,335	2,748	813	688	595
SOMALI	378	468	20	18	723	950	207	245	...	...
BEN-GUMUZ	...	...	...	...	...	...	...	...	...	...
SNNPR	4,428	3,591	290	283	7,819	15,151	884	846	1,210	1,180
GAMBELLA	...	...	...	...	152	209	311	198	...	...
HARARI	226	304	...	...	30	50	23	22	...	...
ADDIS ABABA	4,464	4,247	3,874	4,525	692	1,281	236	221	...	...
Dire Dawa	252	186	73	54	...	...	...	...	...	...
Country Total	25,253	23,145	6,615	6,525	48,233	83,418	4,729	2,683	2,694	2,094
M&F Total	48,398		13,140		131,651	7,412			4,788	

3.2. Human resource for Eye Health (HReH)

The VISION 2020 targets for human resources for eye health (HReH) cadres per million populations are set as: four ophthalmologists, four cataract surgeons, ten ophthalmic officers, ten ophthalmic nurses and twenty optometrists. Furthermore, it targets the cataract surgical rate (CSR) to be 2,000 per million population and 500 per surgeon per year⁷.

According to 2015 reports, there are **132** general ophthalmologists including 20 subspecialists practicing in the country. Of those practicing ophthalmologists, around 60% reside in Addis Ababa and about 49% work

⁷Mapping Human Resources for Eye Health in Sub-Saharan Africa: Progress towards VISION 2020, country fact sheets, <http://www.human-resources-health.com/content/supplementary/1478-4491-12-44-s3.pdf>

either in the private or NGO sector. In addition, there are 210 optometrists, 58 cataract surgeons, 43 ophthalmic officers over 150 ophthalmic nurses and 560 integrated eye care workers (IECWs). Additional information on the HReH can be found in the table 3 below. The number of practicing professionals in Ethiopia is far below the internationally recommended levels of one ophthalmologist to 250,000 people, one optometrist to 50,000 people and one cataract surgeon to 250,000 people. The productivity is low and geographic distribution is unfair, leaving the large majority of the rural Ethiopian population living in underserved areas.

Across Ethiopia, there are only 47 public secondary eye care units and four tertiary centers. Five Universities conduct training for eye health workers, including, Ophthalmologists, Optometrists and Cataract surgeons. In addition, four Hospitals conduct ophthalmic nurse training (ALERT, Yirgalem, Jiggiga and Quiha).

Table 3. Eye Health Human Resources in Ethiopia Updated June 2015

Profession	VISION 2020 target per population	Actual Available Number	Needs	Gap	Remarks
Ophthalmologists (including Sub-specialists)	1/250,000	132	377	245	57% in Addis; 51% in Government institutions; 86% surgically active; 26 females
Non-Doctor Cataract Surgeons		58			4 in Addis; 90% surgically active; 25 females The need for 377 surgeons is for ophthalmic surgeons which includes both ophthalmologist and cataract surgeons. Hence, the gap for ophthalmologist may be filled by cataract surgeons.
Optometrists (Diploma, BSc. MSc)	1/250,000	200	377	177	13% in Addis; 50 graduates annually
Ophthalmic Nurses (Diploma and BSc)	1/100,000	150*	943	793	Both Diploma level and Degree level
Eye Health Managers		20*			MD,/MPH/Msc or Vision 2020 Certified
Integrated Eye Care Workers (IECW)	1/10,000	887	9433	8743	Nurses trained for one month on Primary Eye Care and TT surgeries. Proportion of time allocated for eye care.
Others (Optical workshop Tech)		20*			Professionals trained at least in certificate level and involved either production and/or dispensing of eye glasses

*Approximate figures

Ophthalmologists:

There are three Ophthalmologist training Universities with annual output of 2-6 each (Addis Ababa, Gondar and Jimma universities). There is no sub-specialty level training in the country. Currently some centers are staffed with full (at least 9-12 months) fellowship trained sub-specialists, these are mainly academic Hospitals. Table 5, below, shows the current status of ophthalmologists in the country with sub-specialties. Considering the recommendation of International Agency for the Prevention of Blindness (IAPB) Africa HR need in Sub-Saharan strategic document, the ratio of ophthalmologists to population needs to be 1:250,000 and Ethiopia is currently at 1.5:1,000,000; compared to our neighbors we are lagging behind, if we see Kenya and Sudan are at 2:1,000,000 and 8:1,000,000 respectively¹¹.

Hence, the program needs to train and employ three times more than the current number of ophthalmologists to reach the Africa target of 377. It will be very challenging to reach to this figure in the foreseeable future. With the intention to ameliorate the challenge with shortage of ophthalmologists in Ethiopia, the task shifting to mid level cataract surgeons was started in 2007 for a couple of years. However, the continuation of this task shifting training has been paused for thorough discussions in terms of programmatic effectiveness.

Table 4. Current status of ophthalmologists with sub-specialties (at least 9-12 months fellowships)

Type of sub-specialty	Number	Current status	Remark
Pediatric Ophthalmology	7	2/7 practice pediatric surgery	4 work in the private centers
Anterior segment	9	All practice fully	1 in private center
Retina	5	All practice fully	All in government
Glaucoma	4	All practice fully	All in government
Oculoplastics	2	Practice fully	Works in the government
Neuro-Oph and Uveitis	0	NA	One trained but lives abroad

Optometrists:

There are two schools of optometry, Gondar and Hawassa Universities, with annual output of 40-50. Gondar University has started Master level training in clinical optometry and has graduated four, so far. Additionally, two optometrists were trained as Pediatric Optometrists abroad. Currently, optometrists graduating from the two schools face lack of equipment in their assigned centers, creating significant frustrations from the optometrists' side and hence decreasing their output.

Cataract Surgeons (CS):

The training of cataract surgeons was started in four Universities (Jimma, Gondar, Hawassa, and Mekele) and currently only Jimma University is training the last batch. The training was post basic and not fully integrated within the Universities. Hence, the number of CS has increased very slowly in the last five years. Many centers are suffering from lack of CS or ophthalmologists to fill existing SECU positions, especially in rural clinics. Though there are reservations on continuing the training program, the FMOH plans to continue producing CS as intermediate level plan. However, it is recommended the training be restructured to enroll a wide pool of health professionals, such as, Health officers and general nurses with BSC; additionally, it is encouraged to enroll younger individuals from rural areas so as to avoid resistance to placement in rural areas. Making the training a master's degree level, like the emergency obstetrics and others, may encourage and motivate the CSs to continue to practice.

Ophthalmic Nurses/officers:

There were five training Hospitals (Gondar, Yirgalem, ALERT, Jijiga and Quiha), of which four are currently conducting training. The training is at advanced diploma level, except at Gondar (which was called ophthalmic officers at degree level), and there are issues related to carrier structure, payment and recognition. Standardizing the training and increasing acceptability of the training is essential.

Eye Health Mangers and Optical Workshop Technicians:

As of August 2015, there are no training centers in the country that formally train these cadres, hence, some individuals were sent abroad for this training with support from development partners. Currently, Gondar University is in preparation to launch these types of training. As advocated by VISION2020, each eye health program manager at FMOH, Regions and Zones needs to attend an eye health mangers' training.

3. 4. Infrastructure for Eye Health

Infrastructure development is one of the key pillars of Vision2020. This includes the physical structure of the building and all ophthalmic items (supplies, instruments and equipment). In Ethiopia, the infrastructure for eye health services is scarce and mal-distributed throughout the country (see Table 5, below). According to the latest FMOH report for 2015, there are only 47 SECU, 4 TECU and 579 PECU in the country, including those run by IECWs. At least 200 SECU and TECU centers need to be established; this can be done by integrating eye care facilities in General (Zonal or District) Hospitals and/or constructing new eye units.

In the next five years, the approach will be to establish SECUs by integrating Eye Health in the General Hospitals. This will be accomplished by assigning appropriate HR and availing essential equipment to existing facilities. Three regions currently do not have any SECU and priority will be given to these regions. The plan for developing SECUs will take in to consideration the current and planned HR outputs from the training centers, location of existing SECUs, and the population in the proposed catchment areas.

Table 5. Distribution of primary, secondary and tertiary eye care units in Ethiopia

Region	Tertiary Eye Care Units (TECU)	Secondary Eye Care Units (SECU)	Primary Eye Care units (PECU)
Tigray	0	4	19
Afar	0	1	0
Amhara	1	8	392 (IECWs)
Oromia	1	12	213 (IECWs)
Somali	0	2	7
Benishangul	0	0	0
SNNPRS	1	12	231 (IECWs)
Gambella	0	0	0
Harari	0	1	0
Addis Ababa	1	6	0
Dire Dawa	0	1	0
National	4	47	579

The importation of ophthalmic supplies is currently regulated by the Food, Medicine and Health Administration and Control Authority which sets health standards including registration of products and requirements for importation of health products. The national program needs to enhance coordination with the agency in identifying products needed for the program so that required materials can be availed.

The Pharmaceuticals Funding and Supplies Agency (PFSA), a government institution, is mandated to coordinate procurement of health products. The national program coordinates with the Agency to ensure appropriate quantification of medical supplies, based on performance and program targets, is availed so that uninterrupted supply is availed at facility level. Eye health facilities are advised to avail eye health medications need to PFSA in order for procurement to be initiated. Private suppliers also have room for availing products on a cost-competitive and need basis for both government and private facilities.

1.2.Disease Control

Cataract:

Cataract is the major cause of blindness, up to 51% both in developing and developed nation as reported in 2010. With a backlog of nearly two million visually impaired by cataract in Ethiopia, interventions addressing cataract services will have a large impact on prevalence of blindness. However, the number of cataract surgeries conducted in Ethiopia in 2012 did not exceed 50,000 and the Cataract Surgery Rate and the Cataract Surgical Coverage (CSC) were only 570/million/year and 3% respectively.

Despite significant improvement in HR development as reported by the FMOH evaluation of the second eye care plan⁸, the program does not meet the recommended ratio for ophthalmologist/Cataract Surgeons; 1:250,000 populations. Two times the current number of ophthalmologists/cataract surgeons, 377, are required for Ethiopia. Additionally, the current productivity of CS (ophthalmologists/non-doctor CS) in each center is very low (average <300 per/year/surgeon). According to a research conducted on non-doctor CS, several factors contribute to the low productivity. These include, but not limited to, the lack of surgical supplies, limited availability/functionality of surgical instruments and equipment, lack of support from health managers, low patient flow, and lack of motivation of eye care workers⁹. Additionally the numbers of SECU/TECU are too few (47) and not evenly distributed across the country. Moreover, the quality of cataract surgeries performed has not been well analyzed, with only few attempts by implementing partners.

Refractive Error:

Refractive error is among the top three causes for blindness and visual impairment in both developed and developing countries, including Ethiopia.

⁸CS increased from 84 to 179 in 2014

⁹Mid-Level eye care workers' productivity and tracer study, 2011, Zelalem et al (Orbis unpublished)

According to a survey conducted in Ethiopia in 2006, uncorrected refractive error (URE) causes blindness in 7.8% of the population and causes visual impairments in 33.3% of the population. In Ethiopia, over one million people are suffering from URE, excluding presbyopia which occurs in people over the age of 40 years. Presbyopia affects an additional three million individuals and has a large impact on the economic productivity of adults and learning capabilities of young children. Globally, tackling cataract and URE alone addresses 75% of visual impairment and in Ethiopia it addresses nearly 60% of visual impairment.

A 2013 FMOH report with data from two regions showed that 4,788 prescriptions were issued and of these, 2,390 were from SNNPRS. Orbis also supported the distribution of 4,827 spectacles to underserved populations in 2013.

Trachoma:

Ethiopia is part of the WHA51 declaration to eliminate blindness due to trachoma by 2020. In the 2006 national survey, trachoma was estimated to be responsible for 11.5 % of total blindness in Ethiopia, which is second only to cataract. The prevalence of active trachoma (TF) in children aged 1-9 years was found to be 40.1% and TT in adults above 15 years was 3.1% according to the 2006 national survey. The Global Trachoma Mapping Project (GTMP) conducted from 2012-2015 mapped almost all (540 woredas) previously unmapped rural Woredas with the exception of 20 districts in Ethiopia. The prevalence of blindness due to trachoma was not evaluated but the prevalence of TF and TT was projected to be 27% and 1.2% respectively⁶. However this projection did not include highly endemic Amhara region because it had previously been mapped. The GTMP finding shows the burden of trachoma in Ethiopia is one of the highest in the world (estimated up to TF 50% in endemic areas)¹⁰. The National blindness survey estimated 1.3 million people suffer from the blinding stage of trachoma, TT, in 2006. The GTMP survey finding also showed the number of people suffering from TT was also very high after 8 years of program intervention, at the end of 2014 there were an estimated 691,037 people requiring surgery to achieve the Ultimate Intervention Goal.

The government and partners have been implementing the WHO endorsed SAFE strategy (S=Surgery, A=Antibiotics, F=Facial Cleanliness, E=Environmental Sanitation Improvements) in Ethiopia over the last decade. From the inception of the program in 3 districts during 2003 to the end of 2016, 521 woredas has

¹⁰Ethiopia Journal of Health Development, Eye disease Burden 2005 to 2015, Yemane B

been benefited from the national scale up of SAFE intervention, in these periods more than 1,000,000 TT surgeries have been conducted leaving an estimated 391,758 TT cases at the end of 2016 requiring surgery to correct the eye lid, 236,316,886 treatments of Zithromax have been distributed during annual mass drug administration campaigns in woredas where SAFE interventions have been started. The coverage of access improved water sources reached 65%¹¹ in 2016 a marked improvement from 13% in 1990 and also the coverage of access improved latrine reached 15% from 3% in 1990 and pit latrine in 2016. Unavailability of latrine has also decreased from 45% to 32%¹² since EDHS 2011. Full (100% geographic coverage with more than 76 million treatments are planned to be distributed annually in all endemic districts in 2017 and the years to come until eliminating blinding trachoma as a public health program by the year 2020. The country's effort to eliminate blinding trachoma is not only limited by the usual SAFE implementation, rather SAFE is intensified by new flagship initiative, Fast track Initiative to provide TT surgeries for 693,037 individuals in 2 years time during February 2015. Progress of the Fast track TT initiative is indicated in section 3.7 of the document. Moreover tremendous efforts to improve the WASH coverage are huge government lead initiative that boosts the momentum created in eliminating blinding trachoma.

The launch of this ambitious Fast Track Initiative to address the Surgery component and massive scale up of AFE intervention has showed the country's progress and commitment in eliminating blinding trachoma by the year 2020¹⁴. A total of 44 million Birr was committed from the ministry of health for the training of sufficient number of TT surgeons. Similarly, donors and development partners pledged to match the challenge grant to avail TT kits, consumables and cover operational cost for undertaking TT surgeries.

Over the last 10 years, the S and A components have performed well and are proportionally increasing each year. The commitment of states and local government to prioritize trachoma control as part of health agenda is encouraging, as witnessed at the GET 2020 workshop in Ethiopia held in 2014. However, the still low WASH coverage and limited attention to the behaviour change communication section of F and E components, the expected incident and recurrent TT cases, and program implementation in marginalized regions should be given attention in order to reach elimination goals by 2020. Additionally, a shortage of surgical instruments and supplies in the local market and high attrition of trained health professionals (TT surgeons/IECW) are

¹¹Ethiopia Health and Demographic Survey 2016 key indicator report

¹²Ethiopia Health and Demographic Survey 2016 key indicator report

¹³Ethiopia Health and Demographic Survey 2016 key indicator report

¹⁴FMOH, NTD team report 2013, FMOH

Glaucoma:

Glaucoma is one of the leading causes of irreversible blindness both in developed and developing countries. The prevalence of blindness in Ethiopia attributed to glaucoma as per the 2006 survey is 5.2% and the type of the disease in Ethiopia is typically painless open angle and not noticed until it causes total blindness. There are no data available on service provision in Ethiopia.

Diabetic Retinopathy and other retinal diseases:

Diabetic blindness is one of the major causes of blindness in the developed world and accounts for 3-7% of all causes. It is one of the emerging diseases causing increasing percentages of blindness in developing countries in recent years as result of increasing life expectancy and change in life style. The prevalence of Diabetes in Ethiopia from proxy data is also increasing and estimated to be 4.6 % in age group 15-69 years. There are no community based studies which estimate prevalence of Diabetic Retinopathy (DR) and Diabetic related blindness. Hospital based studies conducted in Menelik Hospital and Jimma University estimate prevalence of DR to be between 30-40% (all stages) among Diabetic patients coming for eye exams compared to 17-50% globally. Retinal detachments and age related macular degeneration are the other retinal diseases contributing to blindness.

Currently there are no Diabetic Eye disease specific programs in Ethiopia except a very small project by Ethiopian Diabetic Association (EDA) in collaboration with world diabetes foundation to screen diabetic retinopathy in five hospitals using fundus cameras and perform Laser treatment in Black Lion hospital with only one ophthalmologist. In 2013, these hospitals screened 2,500 diabetic patients and 1,250 (50%) had Diabetic Retinopathy and referred to ophthalmologists. The number of LASER and Pars Plana Vitrectomy (PPV) conducted were not documented. Additionally 3 private institutions conduct diabetic retinopathy examination and treatment. The advanced form of DR related disease need a treatment called Pars Plana Vitrectomy which is currently available in to three centers for the whole country by two Retina specialists.

Childhood Blindness:

The prevalence of childhood blindness is very low in both developed and developing countries. In Ethiopia childhood blindness is estimated at 0.1% as per 2006 survey. However, the number of blind years for these individuals is very high and its impact is comparable to cataract blindness in adults with 50% prevalence. The causes for childhood blindness vary; however, it is mainly preventable in developing countries through routine immunization and improved nutrition. To date, only Orbis International focuses on this problem in Ethiopia. There are only three TECU that deliver quality pediatric eye health services in Ethiopia. A 2013 report on service provision in the three centers (AAU, Gondar and Hawassa) shows 19,287 children received screening and examination services, including screening at schools.

In total, 7,961 children were treated with either medicine or spectacles and 1,577 were surgically operated. The majority of the outputs were from AAU/Menelik Hospital but service provision in Gondar was relatively advanced since the center is equipped well and has essential staff members. The pediatric eye care team includes a pediatric ophthalmologist, pediatric oriented optometrist, nurse, counselor and biomed technicians who were trained through fellowship.

Cornea Blindness:

Conditions affecting the cornea are the third largest cause of blindness and low vision in Ethiopia, causing 11.3% of blindness. The epidemiology of corneal blindness is complicated and encompasses a wide variety of causes including infectious and inflammatory diseases, trauma, dystrophies, degenerations and complications of cataract surgery that cause corneal scarring, which ultimately lead to functional blindness. Blindness is mainly the result of corneal scarring and vascularization. In addition, ocular trauma and corneal ulceration are significant causes of corneal blindness but are often underreported. Causes of childhood blindness include xerophthalmia, measles infection, ophthalmia neonatorum, and less frequently seen ocular diseases such as herpes simplex virus infections. Traditional eye medicines have also been implicated as a major risk factor for corneal ulceration. Because of the difficulty of treating corneal blindness once it has occurred, public health prevention programs are the most cost-effective means of decreasing the burden of corneal blindness. Establishment of the eye bank of Ethiopia has been a tremendous support for treatment of corneal blindness using corneal transplantation.

4. SWOT Analysis

STRENGTHS	WEAKNESSES/LIMITATIONS
<ul style="list-style-type: none"> • Favourable health policy with emphasis on decentralized and democratized approach. • FMOH Minister’s initiative: Clearing the backlog of blinding cataract, the Fast Track Initiative for TT backlog • Roll out of Health Extension Program and inclusion of hygiene and sanitation/health education in the HEP package. • Implementation of HDA approach to empower communities for their own health • Training and deployment of mid-level eye health professions such as cataract surgeons, optometrists and ophthalmic nurses • HRD strategic plan in place. • Fast expansion of training of optometrists • Rapid expansion of public health facilities • Existence of National Committee for the Prevention of Blindness (NCPB) and National Taskforce for Trachoma Control (NTTC) • Inclusion of Eye Health within the HSTP • Existence of Standardized National Guidelines, Manuals and IEC materials for prevention of blindness • Inclusion of main drugs for eye care in the National Essential Drugs List • Health care financing in place (improved revenue collection and utilization at facility level) • Strong partnership and good working relationship among stakeholders in the 	<ul style="list-style-type: none"> • Shortage of budget for instruments/supplies for eye care • Lack of units to coordinate Prevention of Blindness in most Regions • Shortage of trained eye care workers and lack of career path • Inadequate advocacy for PBL • Delay in scale up of SAFE implementation in highly affected Regions of SNNPR, and Ethiopian Somali • Inadequate supportive supervision to eye care workers at all levels • Weak program monitoring and evaluation system at all levels • Incomplete & poor quality of data on eye care and insufficient inclusion in the HMIS • Inadequate drugs and spectacles for eye care • Shortage & high turnover of qualified staff at program management and patient care levels • Lack of refresher training/continued medical education courses for eye care workers • Lack of school eye health programs • Inefficient Quality Assurance (QA) practice at all levels (implementation of available guidelines, manuals, reports, feedbacks) • Inadequate information communication technologies (computers, internet, fax, telephone...) at eye care units and program management levels • Inadequate operational research and lack of utilization of research findings for better care • Inadequate involvement of the private sector in prevention of blindness • Inadequate rehabilitation of people with blindness • High staff turnover & shortage of skilled eye care workers

<p>prevention and control of blindness and visual impairment</p> <ul style="list-style-type: none"> • Reorganization of the FMOH and establishment of the NCD unit and inclusion of eye health within it 	<ul style="list-style-type: none"> • Poor coordination among different stakeholders both governmental and non-governmental
OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> • Health sector reform • Expansion of health and health related training institutions • Global Initiative VISION 2020: The Right to Sight and GET2020, promoting Global PBL Network and Partnership • Increasing number of partners involved in eye care • Rapid expansion of private health sector • Availability of new improved technologies for the diagnosis and treatment of eye disorders • Increasing number of media for mass information (Radio, TV, printed materials, etc.) 	<ul style="list-style-type: none"> • Global economic instability • Resource limitation • Poverty • High population growth • High level of illiteracy • Inadequate coordination in utilization of means of transportation for integrated supportive supervision. • Poor environmental health and sanitation • Lack of integration between eye health care and general health system • lack of prioritization of eye care services in the health system • Parallel reporting system for eye health care activities

5. Rationale of this Strategic Plan

In Ethiopia, eye care programs have not received the level of attention they deserve at all levels of the health system, meanwhile, the prevalence of blindness and visual impairment in Ethiopia is among the highest in the Sub-Saharan Africa. Visual impairment has serious socioeconomic consequences, particularly in a developing and resource poor country such as Ethiopia. Blind and visually impaired people endure extreme poverty and experience great hardships and are often reliant on their families and communities to complete simple daily tasks. When blindness occurs at an early age, the number of blind years is much longer resulting in a hardship that lasts for longer span of life. Few patients with eye problems can afford to travel to urban centers because of both direct and indirect costs of transportation, food and lodging. Since blindness has direct link with poverty, progress in the economy would contribute directly and indirectly towards achieving significant reduction in the burden of blindness. Most importantly, reducing the level of blindness would contribute to the alleviation of poverty at household, community and country level.

It is estimated that loss of productivity due to blindness and visual impairment globally is over US\$70.9 billion annually in 2010 and would rise to US\$109.5 annually in 2020 if Vision 2020 initiative is not implemented. Ethiopia, with its high level of blindness and visual impairment, significantly contributes to this negative economic picture. Hence, it is essential that blindness and visual impairment issues in Ethiopia be urgently and vigorously addressed in order to realize the country's SDG objective of reducing poverty. Unsatisfactory implementation of previous eye health strategic plans, insufficient human resource, and inadequate infrastructure and equipment for eye health are among the limiting factors for eliminating avoidable blindness in the country. The Government of Ethiopia has recognized blindness as one of the major health problems of the country and has done its best in the past few years. To address this situation, the Ethiopian government launched the VISION 2020 initiative in September 2002, and a declaration of support for VISION 2020 was signed by the President of Ethiopia. With support from this commitment, the FMOH has developed four National Five-Year Eye Strategic Plans in line with V2020 activities. These tasks are coordinated through the national committee for the prevention of blindness (NCPB) chaired by FMOH and membership of the committee includes all relevant stakeholders. Currently the majority of Eye health diseases, except Trachoma, are line managed under NCD team with focal person; while Trachoma is coordinated under the NTD unit, both within the Disease Prevention and Control Directorate.

The FMOH has prioritized eye health in the NCD section of the HSTP. Hence, cataract, refractive errors, glaucoma, childhood blindness, corneal opacities and diabetic retinopathy (including other retinal diseases) are identified as focus areas for support. Childhood blindness is considered in each of the five diseases (Cataract, Refractive Error, Glaucoma, Corneal Diseases and Retinal Diseases) by giving due emphasis as part of comprehensive eye health service delivery. This Strategic Plan is the Strategic Operational Plan (SOP) to execute the eye health component of HSTP. The overarching goal of this is to significantly contribute to the reduction of blindness, visual impairment and trachoma to levels below public health significance by 2020. In order to realize this goal the Strategic Plan will focus on:

a) Reduction of Backlog of Cataract Blindness: As cataract accounts for 50% of blindness in Ethiopia, significant reduction of the backlog can be met by improving access to cataract surgical services. This can happen by establishing new eye care units (SECUs) within strategically selected hospitals and health centres, increasing the quality of existing secondary and tertiary eye care units and increasing the productivity of professionals.

b) Implementation of full SAFE strategy: The full SAFE strategy will be significantly expanded in trachoma endemic areas of the country with due attention given to the quality as well as quantity of the services.

c) Addressing Refractive Errors: The expansion of refractive error services, including access for low cost eyeglasses to students as part of school eye health, and the public at large.

d) Addressing other important eye diseases: Increase case detection, referral and treatment of glaucoma, corneal opacities, childhood eye problems and diabetic retinopathy through targeted coordination between general medical clinics, specialty clinics and eye care centres. This will be done by creating awareness and sensitization opportunities for health professionals and the general public. A viable system for linkage will also be established.

e) Enhancing knowledge and practices on eye diseases prevention and eye care services utilization: In the Ethiopian context access to services does not guarantee utilization. Therefore, a well-designed IEC/BCC campaign will be implemented to inform and motivate the general public to utilize the eye care services. Appropriate community mobilization will be used to develop positive health behaviours for the prevention and control of eye diseases through the principle of Health Extension Program enhanced by the Health Development Army.

f) Research, Monitoring and evaluation: The progress and success of the planned eye care services will be verified through regular tracking and measurement of changes. A focus will also be placed on provision of supportive supervision. Outcome/service indicators from the HMIS will be analysed as appropriate.

In this Strategic Plan, the priority focus areas of interventions to support services delivery and diseases control of eye health are: Eye Health Human Resources Development, Infrastructure development (Physical facilities and Equipment) and supply chain management.

Chapter Two: Vision, Mission, Goal and objectives of the Strategic Plan

Vision: To see healthy and productive Ethiopians free from avoidable blindness and visual impairment.

Mission: To reduce the prevalence of blindness and visual impairment through implementation of promotive, preventive, curative and rehabilitative eye health services.

Goal: To provide accessible, equitable, inclusive, affordable, comprehensive, integrated and sustainable quality eye health care services and empower the Ethiopian community to boost service utilization and adopt healthy eye care practices to reduce visual impairment by 2020

Strategic Objective 1 - Empowering and engaging the community to create sense of ownership, increase service utilization and adopt healthy eye care practices/Creating community ownership in eye health.

- 1.1 Community aware of available eye health services and increase service utilization
- 1.2 Community engaged in eye health care delivery process
- 1.3 Community adopt and implement healthy eye practices

Strategic Objective 2 - Providing integrated quality eye health service at all levels

- 2.1 Health facilities have sufficient functional medical equipment and supplies
- 2.2 Health facilities have enough space and trained eye care personnel
- 2.3 Systems in place for preventive maintenance for medical equipment
- 2.4 Quality assurance for cataract surgical outcome in place
- 2.5 Improved accessibility of eye health care services

Strategic Objective 3 - Strengthening Human Resources for eye health

- 3.1 Increase personnel to population ration of eye care and allied ophthalmic personnel
- 3.2 Inclusion of eye health in HEW package and train HEWs
- 3.3 Inclusion of eye health in teachers' PEC manual and train teachers
- 3.4 Review and update curriculum of ophthalmic nurse, cataract surgeon, optical technicians and eye health managers
- 3.5 Develop ophthalmology sub-specialty curriculum and initiate training in country

Strategic Objective 4 - Improving infrastructure and logistics for eye health

- 4.1 Increase number of eye care units
- 4.2 Sustainable medical supplies for eye health
- 4.3 Placement of functional medical equipment at all eye health facilities.
- 4.4 Establish national optical maintenance workshop and training center

Strategic Objective 5-Generating evidence and improving monitoring and evaluation for informed decision making.

- 5.1 Conduct national survey on blindness and low vision
- 5.2 Support and promote research by professionals
- 5.3 Encourage sharing of research findings on conferences
- 5.4 Improve capacity for eye care research by professionals
- 5.5 Establish a national eye care resource and research center
- 5.6 Additional eye health indicators included in the national HMIS
- 5.6 Improved data collection and reporting system
- 5.6 Develop and revise registers for eye health services

Strategic Objective 6 - Enhancing Partnership across all stakeholders for harmonization and alignment of eye health activities

- 6.1 Integrated eye health services with various stakeholders
- 6.2 Conduct regular annual review and TWG meeting
- 6.3 Ensure eye health reports for the private sectors are incorporated in the national reports.

Strategic Objective 7 - Improving eye health governance and ownership across all levels in government structures

- 7.1 Awareness raising of leaders and decision makers about eye health
- 7.2 Integration of eye health agenda integrated in general health
- 7.3 Production of policy, directives and guidelines on eye health

Chapter Three: Strategic focus area 1: Disease control

Strategic focus areas of Eye Health in Ethiopia in EFY2008-2012 (2015-2020 G.C.) include:

- Strategic focus 1: Eye Health Service provision/Disease Control
- Strategic focus 2: Eye Health Human Resources Development
- Strategic Focus 3: Eye Health Infrastructure Development

This chapter deals with the first strategic focus of eye health in the strategic period that is, Eye health Services Provision/Disease control.

1. Cataract

Cataract is the major cause of blindness in Ethiopia so interventions addressing cataracts will have a large impact on prevalence of blindness. There is a current backlog of nearly two million visually impaired from cataract; however, the number of cataract surgeries conducted in Ethiopia in 2012 alone did not exceed 50,000. As a result, the Cataract Surgical Rate (CSR) and the Cataract Surgical Coverage (CSC) were only 570/million/year and 3% respectively.

In order to meet the WHO recommended ratio of 1 ophthalmologist per 250,000 populations and the CSR of 2000/million/year by the year 2020, the number of ophthalmologists or cataract surgeons trained to conduct cataract surgery should increase by approximately 377. Additionally, the current productivity of each CS (ophthalmologists/non-doctor CS), which is now <300 per/year/surgeon, will need to increase to 1000/year/surgeon by the year 2020.

Several factors contributing for the low number of cataract surgeries include:

- low human resource
- lack of surgical supplies
- limited availability/functionality of surgical instruments and equipment
- lack of adequate support from health system
- low patient flow
- inadequate commitment of eye health professionals
- lack of effective and efficient use of available resources

Additionally, the number of SECU/TECU are very few (47) and not evenly distributed across the country. Motivation of the eye care workers was also found to be low due to remuneration and incentives related issues. The quality of surgery provided was not analyzed except few attempts by implementing partners. Currently, cataract surgeries are performed at a static/facility, outreaches, and campaign. Each service modality has its advantages and disadvantages, an outline of these can be found in Table 2 below. Though facility based eye care delivery is the ideal modality, for low-income countries like Ethiopia, outreach and campaign modalities are vital to reaching patients residing far from facilities.

Table 6. Eye health service modalities: Static, Outreach and Campaign

Points	Static	Outreach	Campaign
Ease of programmatic monitoring	+++	+	-
Proper Patient follow up	+++	+	-
Patient reachability	+	++	++
Program Sustainability	+++	+	-
Data quality and availability	+++	+	-

In order to alleviate the problems mentioned above, the national guideline on promoting and standardizing CSS, based on the WHO guidelines and best practices, needs to be improved.

The national guideline needs to address the following issues:

- Outreach services and participation need to be encouraged by each eye care provider
- Licensure of expatriate surgeon monitoring should be mandatory by FMHACA and relevant professional associations
- Local surgeons should always join cataract surgical activities conducted by expatriates
- Infection prevention guidelines from the FMOH should be the standard practice
- Quality in terms of outcome should be monitored in all modalities of cataract surgical services
- Cost sharing should be encouraged in campaigns and outreaches

Strategic intervention actions:

The objective of the Ethiopian eye health national strategy is to provide cataract surgeries at a level that would clear the backlog of cataract in the country. Accordingly cataract surgeries of 120,000 or more per year are expected to be conducted to achieve a minimum of 600,000 surgeries in the next five years. Accordingly, the following interventions will be implemented.

- Revitalize and promote cataract surgeries at eye health units. Expand and increase number of SECU and PECU facilities.
- Implement Outreach and Mobile Cataract surgical services
- Conduct nationwide Cataract surgical campaigns
- Engage and motivate the private sector
- Increase cataract surgical productivity of surgeons
- Create cataract surgical services demand within the community
- Mentoring and Supportive supervision from TECU to SECU and PECU

Table 7. Summary of Cataract strategic implementation actions and activities

Strategic Implementation Action for Cataract	Activities	Measurement	Ultimate goals
Revitalize and promote cataract surgeries at eye health units	Eye care units shall be revitalized and promoted to deliver quality cataract services. Facilities shall have sustainable supply of eye care supplies and equipment. Center will be staffed adequately.	Number of eye units fully functional and delivering cataract surgeries	<p style="text-align: center;">740,000 Cataract backlog cleared</p> <p style="text-align: center;">CSR reached 2000 Surgeons productivity increased to 1,000 Per year per surgeon</p>
Expand and increase number of SECU and PECU	Establish SECUs and PECU in all regions with proportional distribution and number. PECU will serve as an outreach and campaign satellite centers, as well as to serve for screening and referral network.	Number of new SECU and PECU established and fully functional	
Implement Outreach and Mobile Cataract surgical services	Outreach and mobile cataract surgery services shall be organized and conducted in regular bases from that of the base/centers.	Number of outreach and Mobile services	
Conduct nationwide cataract surgical campaigns	Conduct nationwide cataract campaigns both in urban and rural settings until the backlog of cataract in the nation cleared.	Number of Cataract Campaigns carried out	
Engage and motivate the private sector	Cooperation, coordination and empowerment of the private sectors. Reporting of services provided by the private sector must be coordinated and harmonized with the MOH	Number of Private centers reporting CS to the MOH	
Increase cataract surgical productivity of the surgeons	Provide supplies and support staff. FMOH in collaboration with partners will work to ensure all essential inputs available in the country and the health facilities	Number of surgeons who increased productivity	
Create cataract surgical services demand among the community	Communities should be informed and aware regarding service for cataract and its benefits.	Number of public awareness activities	
Mentoring and supportive supervision from TECU to SECU to PECU	TECUs shall provide periodic and sustainable mentoring and supportive supervisions to SECUs and PECUs	Number of supportive supervision and mentoring activities	

2. Refractive errors

Refractive error is second leading cause of blindness and visual impairment in Ethiopia. According to the 2006 survey, uncorrected refractive error (URE) prevalence of blindness is 7.8% and for low vision 33.3% in Ethiopia. Based on this, over one million people are suffering with URE, excluding presbyopia which occurs in people over the age of 40 years. If presbyopia is included the number of people affected by URE reached three to four million, having a huge impact on economic productivity of adults and learning capabilities of young children. Tackling cataract and URE alone addresses 60% of visual impairment Ethiopia.

As per the 2013 FMOH report URE data was only available from two regions: 4,788 prescriptions were issued and of these 2,390 were from SNNPR. In 2013 data from ORBIS, 4,827 spectacles were distributed to underserved populations. Data on types of refractive errors and services availability is not available using the current reporting structure. The HMIS does allow the user to list refractive errors as a separately. In order to aid in planning, it is essential the list of refractive errors is included in the HMIS currently being developed.

Focus on the improvement of infrastructure and consumables required for refractive errors are essential. Optical workshop strengthening, in terms of well-equipped/trained man power, is the most important. There should be a quality control method for regulation of consumables like eye glasses. Affordability of glasses can be increased using methods like ‘One dollar glass’ where the glasses are imported and frames are made with cheap materials in the country though aesthetic value is an issue. Roadside and over the counter selling of glasses without prescription should be strictly avoided. Additionally, behavioral and cultural barriers surrounding the uptake of spectacles need to be addressed.

Despite the fact that the number of optometrists is increasing significantly, most of these individuals are not practicing because of inadequate number of infrastructure. The FMOH, in collaboration with partners, needs to work on the establishment and equipment of primary eye care units in existing health institutions. Screening of children at primary school level using trained school teachers and existing eye care centers is vital for early detection and correction of refractive errors.

Strategic Intervention actions for URE

- Establish and strengthen refractive services within existing health facilities
- Implement school eye health and refractive services
- Promote Outreach/Campaign to include refractive services
- Demand creation for refractive services

Table 8. Summary of refractive error strategic action and activities

Strategic implementations actions for URE	Activities	Measurement	Ultimate goals
Establish or strengthen refractive services within existing health facilities	All TECU, SECUs and PECUs strengthened to provide comprehensive refractive services. The Ministry, in collaboration with implementing partners, will ensure optometrists are working and equipment and inputs are available in adequate quantity and quality.	Number of eye units providing refractive services	All eye units deliver refractive services Percentage of schools delivering eye health services All outreach for Cataract and Trachoma incorporate refractive services
Implement school eye health and refractive services	School teachers trained to deliver eye health activities including screening for URE, improving awareness and referring children with to eye units.	Number of schools delivering eye health including URE	500,000 people screened for URE 275,000 people received eye glasses
Promote Outreach/Campaign to include refractive services	Integrate refractive services in all outreach and campaign activities of cataract and trachoma interventions	Number of outreaches incorporating refractive services	
Demand creation for refractive services	Public awareness through intensive and sustainable awareness creation using print and electronic media, HEW and the HDA and subsequently seconded by quality refractive services will build up communities' confidence in overall eye care services	Numbers of public awareness activities	

Indicators to be used for measuring refractive errors interventions include

- Number of schools performing screening
- Number of students screened at schools
- Number of adults screened for refractive errors
- Number of students who received eye glasses
- Number of adults who received eye glasses

3. Glaucoma

Glaucoma is one of the leading causes of irreversible blindness in Ethiopia. The prevalence of blindness in Ethiopia attributed to glaucoma as per 2006 survey is 5.2% and the type of the disease is painless open angle and not noticed until it causes total blindness. There are no data available on the level of service provision in Ethiopia.

The major challenge for prevention blindness from glaucoma is late presentation. Some of the measures that should be taken are health promotion on glaucoma, integration of glaucoma in health science training curriculum, training of midlevel eye health care professionals on the early detection and diagnosis of glaucoma and routine screening for patients above 40 at eye care centers.

The treatment modalities for glaucoma are medical, laser and surgery. However, the treatment modalities are not widely available as a result of shortage equipment and expertise.

Strategic Intervention actions:

- Screening for glaucoma by mid-level eye professionals and general ophthalmologists
- Glaucoma treatment at SECU and TECU
- Perform period public awareness activities

Table 9. Summary of Glaucoma strategic interventional actions

Strategic interventional actions for Glaucoma	Activities	Measurements	Ultimate goals
Screening for glaucoma by mid-level and general ophthalmologists	Eye health professionals will be trained and updated on glaucoma detection	Number of people screened for glaucoma	150,000 diagnosed and medically treated 15,000 people with glaucoma surgically treated Number of SECU delivering glaucoma services Increased % of glaucoma awareness
Glaucoma treatment in all SECU and TECU	All SECU equipped and supplied for glaucoma	Number of SECU equipped with glaucoma diagnostic equipment and medicines	
Perform period public awareness activities	FMOH and professional association conduct period awareness activities with all media outlets	Number of public awareness activities	

Indicators for glaucoma inventions are:

- Total number of glaucoma patients on follow up and medical treatment
- Number of newly diagnosed cases
- Total number of surgeries
- Number of laser treatment services

4. Diabetic Retinopathy and other retinal diseases

Diabetic Blindness, an emerging disease in Ethiopia because of increased life expectancy and life style change, accounts for 3-7% of blindness in the world. The prevalence of diabetes in Ethiopia from proxy data is increasing and estimated to be 4.6% in 20-79 year olds. Only a limited number of community-based studies estimating prevalence of diabetic retinopathy (DR) and diabetic related blindness. Hospital based studies in Menelik Hospital and Jimma University estimates prevalence of DR to be between 30-40% (all stages) among diabetic patients reporting for eye exams compared to 17-50% globally. Retina detachments and age related macular degeneration are the other retinal diseases contributing to blindness.

Strategic Intervention actions:

- Awareness creation on DR and Age related Macular Degeneration (AMD)
- Deliver treatment for DR, AMD and retinal detachment

Table 10. Summary of strategic interventional action for Retinal diseases

Strategic interventional actions for Retina Diseases	Activities	Measurements	Ultimate goals
Create awareness on DR and AMD	Conduct awareness activities for community and health professionals for caring for diabetic patients through all media outlets	Number of awareness activities	Awareness increased among community and health professionals
Deliver retinal services both at SECU and TECU	Deliver retinal screening in all SECU and task shift Laser services for general ophthalmologists	Number of SECU having retinal services and number of ophthalmologists performing Laser	21,350 people benefited from Retinal services

Indicators for measuring activities/interventions on diabetic retinopathy and other retinal diseases are

- Number of Health facilities screening DR
- Number of People screened for DR
- Number of People Laser treatment for DR
- Number of people surgically treated for DR
- Number of people treated with anti Vascular Endothelial Growth Factor (VEGF) and steroid
- Number of people diagnosed with RD
- Number of people surgically treated for RD
- Number of people diagnosed with AMD
- Number of people treated for AMD

5. Childhood Blindness:

The prevalence of childhood blindness as a cause of blindness is estimated at 0.1% as per 2006 survey. However the number of blind years is very high and its impact is comparable to cataract blindness in adult with 50% prevalence. Unfortunately, few organizations are working in this area. Some of the common causes of childhood blindness are congenital cataract, Congenital Glaucoma, Refractive errors, Strabismus, Amblyopia, Retinoblastoma and Vitamin A deficiency.

There are only three TECU delivering childhood blindness and low vision (CHBLV) services in the whole country with relatively fair quality. The service provision in the three centers (AAU, Gondar and Hawassa) in 2013 shows 19,287 children received screening/examination services including schools screening.

Results show that 7,961 children were treated either with medicine or spectacles and 1,577 children were surgically operated. The majority of the outputs were from AAU/Menelik but services provision in Gondar was relatively advanced since the center is equipped well and essential staffs (pediatric eye care team which includes the pediatric ophthalmologist, pediatric oriented optometrist, nurse, counselor and pediatric anesthetist) are trained through fellowship.

Emphasis should be given on increasing the number of pediatric anesthetists. Additionally, the attrition rate of pediatric ophthalmologists is high and few are practicing. Therefore, it is recommended to give in-service training to ophthalmologists to address child eye health.

Equipping and training pediatricians and other healthcare professionals on child eye care will greatly contribute in decreasing the magnitude of the issue. Low vision centers should be opened to promote child eye health.

Strategic Intervention actions childhood blindness:

- Establish or strengthen CHBLV services at TECU
- Deliver some component of CHBLV services at SECU
- Establish referral network from Primary to Tertiary level
- Increase awareness in the community and professionals

Table 11: Summary of childhood blindness strategic actions

Strategic actions for CHBLV services	Activities	Measurement	Ultimate goals
Establish or strengthen CHBLV services at TECU	Establish/s`trengthen comprehensive CHBLV services in all TECU with appropriate equipment, supplies and a full team trained on CHBLV	Number of TECU delivering comprehensive CHBLV services	All TECU deliver CHBLV services 12,500 children surgically treated All ophthalmologists at SECU deliver some component of CHBLV services Referral network established Awareness on CHBLV increased
Deliver some component of CHBL services at SECU	All SECU with ophthalmologists deliver CHBLV screening services and treat some of the cases which are in line with their skills	Number of SECU delivering component of child eye health services	
Establish referral network from primary to tertiary level	Train health professionals, teachers and parents on child eye health and establish systems and network for referral from primary to tertiary	Number of people trained and children referred	
Increase awareness in the community and professionals	Conduct awareness activities on CHBLV through all media outlets	Number of awareness activities	

6. Corneal opacities

Diseases affecting the cornea are one of the major cause of blindness and low vision in Ethiopia and third only to cataract and refractive error. The epidemiology of corneal blindness is complicated and encompasses a wide variety of causes including infectious and inflammatory diseases, trauma, dystrophies, degenerations and complications of cataract surgery that cause corneal scarring, which ultimately lead to functional blindness. While cataract is responsible for nearly 50% of the total blind people in Ethiopia, the next major cause is trachoma which blinds 11.3%, mainly as a result of corneal scarring and vascularization. Ocular trauma and corneal ulceration are significant causes of corneal blindness that are often underreported. Causes of childhood blindness include xerophthalmia, measles infection; ophthalmia neonatorum, and less frequently seen ocular diseases such as herpes simplex virus infections. Traditional eye medicines have also been implicated as a major risk factor for corneal ulceration. Because of the difficulty of treating corneal blindness once it has occurred, public health prevention programs are the most cost-effective means of decreasing the burden of corneal blindness.

Establishment of the eye bank of Ethiopia has been a tremendous support the treatment of corneal blindness using corneal transplantation.

Strategic Intervention actions for corneal blindness:

- Support and strengthen Eye Bank of Ethiopia services
- Strengthen TECU to deliver cornea transplantation services
- Increase awareness of community on corneal blindness prevention and promotion

Table 12. Summary of strategic interventional actions for Cornea blindness

Strategic actions for Cornea blindness	Activities	Measurement	Ultimate goals
Support and strengthen Eye Bank of Ethiopia services	Eye Bank of Ethiopia will be supported through legislation and financial support by FMOH and all stakeholders	Transplantation Legislation in place and amount of money EBE generated and supported	Transplantation services available in all centers with trained cornea specialist Cornea transplantation coverage increased 2,000 cornea transplantation and 3,000 other cornea surgeries performed
Strengthen TECU and to deliver Cornea transplantation services	All TECU and some SECU equipped and staffed with transplantation services	Number of SECU/TECU delivering cornea transplantation services	
Increase awareness of community on corneal blindness prevention and promotion	Community awareness increased through all media outlets on promotion of vaccination and Vitamin A supplement	Number of awareness activities conducted	

Indicators for corneal opacities' activities/interventions

- Number of corneal surgeons
- Number of centers performing corneal transplantation
- Number of corneal tissue harvested
- Number of corneal tissues transplanted

7. Trachoma

Trachoma is the leading cause of preventable blindness worldwide and is targeted for elimination by the WHO by the year 2020. Trachoma is not only a blinding scourge but an infectious disease causing serious human suffering and indignation. This, in turn, affects the productivity and quality of life of the entire family. Trachoma is a disease of poverty and underdevelopment.

Over the past couple of years, one major step forward for the trachoma control program in Ethiopia is the implementation of the Global Trachoma Mapping Project (GTMP), which was funded by the UK government through its bilateral agency, DFID. This initiative enabled the MOH to carry out trachoma surveys in all unmapped woredas in the country and has provided baseline data for all woredas. This has allowed the program to conduct evidence-based comprehensive planning and progress monitoring. Based on this survey, 657 rural districts are known to be endemic and populations of more than 75 million are at risk of acquiring trachoma in 2015.

The prevalence of active trachoma ranged from 0.2% to 73.4% and that of trachomatous trichiasis ranged from 0.2% to 12% with an average prevalence of 4%. The burden of the disease is far from the elimination target of prevalence of active trachoma in children 1-9 years old below 5% and prevalence of trachomatous trichiasis below 2/1,000 in people above 15 years old. This puts Ethiopia as top in the list of highly affected countries followed by Nigeria and Malawi by the number of people at risk of trachoma and by India and Nigeria by the number of estimated number of people affected by trichiasis¹⁵.

Following the mapping of trachoma, the FMOH in collaboration with partners has re-examined the Ultimate Intervention Goal (UIG) to eliminate trachoma and developed national and regional Trachoma Action Plan to scale up SAFE intervention.

- The UIG for AFE intervention in 657 woredas with a TF prevalence $\geq 5\%$ among children 1-9 years of age, an estimated population of more than 75 million require one or more years of annual mass drug administration (A), facial cleanliness (F) and environmental improvement (E) interventions.

¹⁵International Coalition for Trachoma Control (2016) Eliminating Trachoma: Accelerating Towards 2020 WHO Alliance for the Global Elimination of Trachoma by 2020.

The UIG for surgery in the 665 woredas with a TT prevalence of ≥ 2 per 1000 among people above 15 years old is estimated to be 691,037 people who require surgery (S) to correct eyelid alleviate pain, suffering and ultimately prevent blindness.

FMOH in collaboration with partners has scaled up SAFE intervention to reach the national as well global target of elimination of blinding trachoma by the year 2020. So far this huge SAFE intervention scale up program has reached 82% (541 districts) geographic coverage and more than 51 million people received MDA during 2016. F and E interventions are also implemented as part of the national WASH intervention in all districts and specifically trachoma targeted F and E behavior change communications in the 541 districts. Encouraging achievement has been witnessed by implementing SAFE intervention through impact assessment surveys conducted in districts completing the recommended rounds of annual MDA. From an impact assessment surveys conducted in 159 districts during 2015 and 2016, 40 districts were able to discontinue annual MDA after achieving the minimum threshold of TF prevalence of $< 5\%$. Moreover TF prevalence has been reduced from the baseline in 82 districts. However in 27 districts TF prevalence has increased from the baseline. The FMOH has strengthened the commitment and mobilize the necessary resources to reach 100% geographic coverage in the coming years, to cover 110 districts has not been started SAFE intervention in 2016.

Regarding the Surgery component of the SAFE intervention; Trichiasis surgery is the corner stone for the population already affected with scarring of the conjunctiva and in turned eyelashes. Cognizant of the pressing need the Ministry of Health renewed commitment to reach the Ultimate Intervention Goal for surgery by launching Fast Track initiative to clear the TT backlog in the country by June 2017. FMOH in collaboration with international and local development partners has developed a plan to boost the current efforts. A total of 44 million Birr was committed from the ministry of health for the training of sufficient number of TT surgeons. Similarly, donors and development partners pledged to match the challenge grant to avail TT kits, consumables and cover operational cost for undertaking TT surgeries.

This is an encouraging undertaking that will address the challenge of blinding trachoma by eliminating the huge national TT backlog in the coming few years.

The TT service in the country operated more than 1,000,000 individuals' with TT from 2003-2016. More than a third of the national output of surgery was done in two years, 2015 & 2016, after the launch of the Fast Track Initiative, whereas two third of the surgery took 11 years from 2003-2014.

Fast Track TT initiative has been instrumental to boost the momentum obtained by the national scale up of SAFE intervention. Moreover the fast track TT initiative has shown marked improvement in commitment and ownership of the program by the health system and hence TT surgery intervention is now considered as a routine activity in the health system rather than an activity of a partner.

Since the launch of Fast Track TT initiative in February 2015 until 2016, a total of 887 IECWS were trained and deployed, 656 Health centers provide TT surgery in static and outreach service and a total of 301,279 TT cases had received TT surgery, which accounts 43% of the total Ultimate Intervention Goal for surgery. The fast track initiative has been short of achieving the target as a result still an estimated 391,758 TT cases needs urgent surgery services to reach the Ultimate Intervention Goal (UIG) for surgery. The achievement is remarkable even at the Global level. WHO GET 2020 in its 2017 meeting reported close to 71% of the 2016 global output of trichiasis surgery was performed in Ethiopia¹⁶.

Blindness from diabetic retinopathy is an emerging factor for loss of productivity and rising health costs. Reportedly, almost 50% of diagnosed diabetics in Nairobi and almost 20% in rural Central Kenya, had diabetic retinopathy, with the majority never having undergone any eye examinations before.

The main contributing factor for the still huge backlog is the marked difference in leadership and commitment of health managers and decision makers across regions, zones and woredas.

The figure below showed national and regional level TT surgical output in 2015 and 2016.

Table 13. National and Regional TT surgical output 2015 & 2016

Region	UIG at the end of	2015 Surgery	2016 Surgery	Total surgery	Remaining UIG	% remaining
Afar	1,707				1,707	100%
Amhara	336,314	76,953	111,687	188,640	147,674	44%
BG	2,586				2,586	100%
Gambella	4,834				4,834	100%
Oromia	171,094	12,838	34,176	47,014	124,080	73%
SNNP	124,454	21,001	26,864	47,865	76,589	62%
Somali	15,447				15,447	100%
Tigray	36,601	6,295	11,465	17,760	18,841	51%
Total	693,037	117,087	184,192	301,279	391,758	57%

As seen from the above table, a huge difference in performance is observed across regions and a similar contrasting performance has also been observed across zones as well across woredas to the extent even within the same region. This has a massive contribution to the high backlog still remained to be cleared.

Hence it is very important to take the lesson from high performing regions, zones and woredas to achieve the target. The major contributing factors to excellent achievement is involvement and good leadership of decision makers across different levels, regular performance review and monitoring, participation of HEWS

¹⁶ WHO WEEKLY EPIDEMIOLOGICAL RECORD, NO 26, 30 JUNE 2017

in TT case identification and community awareness raising activity and organizing outreach service, good support and TT cases mobilization during outreach service.

Currently Trachoma is part of the Neglected Tropical Diseases (NTDs) under the NTD Team. A national NTD Master plan and a National Trachoma action plan have been developed to guide Trachoma control program in the country.

Please refer the Trachoma Action Plan documents for better information. Despite the placement of the trachoma program in the NTD sector, the Surgical (S) and the Antibiotic treatment (A) components of the SAFE strategy will be carried out close collaboration with eye health institutions and eye health professionals. Hence, trachoma specific issues not included in detail this National Strategic Action Plan. The full trachoma strategic plan will be found in the National Trachoma Action Plan the NTD Master Plan.

Chapter Four: Strategic focus 2: Human Resources for Eye

Current situation and five-year Eye Health Human Resources Development plan

Currently there are five universities (AAU, Gondar, Jimma, Hawassa and St. Paul's Millennium College) conducting eye health workers training at different levels. These trainings include: ophthalmologist, optometrist, cataract surgeon and other allied eye health workers. Additionally, seven hospitals conduct ophthalmic nurse training (ALERT, Yirgalem, Jijiga, Dessie, Nekemt, Gondar and Quiha). In 2015 (2007 E.C), there are approximately 130 ophthalmologists, 210 optometrists, 58 cataract surgeons and 150 ophthalmic nurses (both Diploma and B.Sc level). Though the training period and content varies, it is estimated that 690 IECWs, 20 eye health managers and 20 optical technicians/dispensers are also available. There is no available data on how many HEW/HDA and teachers are trained and provide eye health services.

The operationalization of the eye health strategic plan is based on the availability of new training institutions for all levels of trainings including: one sub-specialty training center (AAU), two post-graduate ophthalmology centers (Hawassa university and Millennium College) and upgrading the five diploma-level ophthalmic nurses training centers to BSc level and adding three new ophthalmic nurse training centers (Oromia/Amahara/AA regions). Gondar University is currently preparing to open a new Eye health Managers and Optometry Technicians/dispensers training. Place of Non-Doctor Cataract Surgeons (NDCS) training program in cataract surgery program will be reviewed as an opportunity to address the low man power in the area

A three day training of HEW/HDA and teachers will be provided to review the incorporation of new eye health training modules in the HEW training manuals.

Table 14. Eye Health Training centers 2016-2020 G.C.

Eye Health Profession	Current	New	Total
Ophthalmologist training universities	3	3	6 (Hawass and SPMMC already started)
Subspecialty level ophthalmologist training	0	1	1(AAU-CHS school of medicine at Menelik II Hospital)
Optometry B.Sc, M.Sc and Phd. training centers	2	0	
Ophthalmic nurse(Bsc) level	0	8	8 (Gondar, Nekemet, Dessie already started)
Health manager	0	1	1 (+2 abroad)
Optical technician	0	1	1

The number, type and roles and responsibilities of different eye health eye professionals and allied eye health workers for the coming strategic operational period are outlined in the next section.

1. Community level eye health care workers (HEW, HDA and Teachers)

Health extension workers, health development armies and primary school teachers will play a paramount role in increasing access and utilization of eye health services. Accordingly, they will have the following roles:

- Health promotion and awareness creation,
- Screening,
- Community mobilization,
- Follow up and referrals

The HEWs will also be responsible for training HDAs in their catchment areas. The period for HEW and teachers training on eye health will be 3 days. Additionally, eye health training will be incorporated in the HEW training curriculum.

Table 15. Staffs for community level workers number and detailed plan in 5 years

Type of professionals	Current	2016	2017	2018	2019	2020	Total
Urban HEW			3,000			3,000	3000
Rural HEW				33,000			33,000
Teachers		5,000	5,000	10,000	20,000	20,000	60,000
Total		20,000	20,000	34,000	50,000	56,000	180,000

NB: Current # of HEW 36,000 and projected to reach 40,000

Current Primary schools are nearly 30,000 and training 2 teachers from each

2. Human resource for Primary Facility Level (PECU)

Primary Eye Care/facility Units (PECU) are currently run by IECWs who have completed a 4-6 week training. However, it is important to note the content and duration of training were not standard, nor were they comprehensive enough to address most eye health problems. Hence, the training will be standardized in this strategic period. Additionally Ophthalmic Nurses can be assigned as frontline eye health workers. The roles of IECW or PECU facility level services include: eye health promotion and awareness creation; screening of major eye health including Cataract, RE, Glaucoma and Trachoma; medical treatment of simple eye infections including Trachoma; TT surgeries and other minor lid surgeries, follow up and referrals; and

Training strategies include:

- Incorporation of eye health in the general nursing training for IECW
- Short-term standardized 4-6 week training for IECWs
- Standardization of the B.Sc Ophthalmic nursing training.

Table 16. Staffs for PECU number and need for next 5 year SOP

Type of Professional	Current	2016 G.C	2017	2018	2019	2020	Total
IECW	690	500	500	500	500	410	3,600
Ophthalmic Nurses	150	10	10	130	250	250	800
Total	840	510	510	580	700	610	4,400

]]NB: Ophthalmic Nurses is for all levels: PECU, SECU and TECU

3. Human resource for Secondary and Tertiary eye facilities (SECU and TECU)

Secondary level eye health professionals include ophthalmologists, optometrists, cataract surgeons and other allied eye health professionals. In this strategic plan, an increase in cataract surgeon trainings is prioritized due to a substantial gap of ophthalmologists both in number and geographic distributions. The cataract surgeon training curriculum will be revised and placement of cataract surgeons needs to be prioritized at the primary and general hospitals, not at tertiary level facilities.

Strategies for eye health HR development for SECU and TECU include:

- Curriculum development for new training
- Fellowship for sub-specialty training
- Infrastructure development for AAU-CHS-School of Medicine
- Partnership and support
- AAU-CHS -school of Medicine will initiate training at sub-specialty level for Ophthalmologists
- Gondar Optometry department initiate sub-specialty training for Optometrists
- Gondar university will be supported for training Optical technicians and eye Health managers

Centers for Cataract surgeons training will be identified and supported

Table 17. Ophthalmologists, Sub-Specialists and other eye health workers for SECU and TECU

Type of Professionals	Current	2016 G.C	2017	2018	2019	2020	Total
Ophthalmologists	132	10	13	24	30	65	274
Cataract Surgeons	56	0	0	20	30	30	138
Eye Health Mangers	20	0	0	0	15	15	50
Optical Tech/Disp	40	0	20	20	20	20	120
Sub-Specialist							
A-Segment	9	0	1	2	4	4	20
Pediatric Ophth.	9	0	2	2	2	2	17
Glaucoma	4	0	0	2	3	3	12
Retina	7	1	2	2	2	2	16
Oculo-Plastics	2	0	1	1	2	2	8
NOP	0	0	0	1	2	2	5
Optometry Sub-specialists							
Low vision	0	0	1	1	1	2	5
Pediatric optometry	2	0	1	1	2	2	8
Orthoptist	0	0	0	1	2	2	5
Contact lens	0	0	0	1	2	2	5

Chapter five: Strategic Focus 3: Infrastructure for Eye Health

The infrastructures for eye health services are scarce and mal-distributed throughout the country. According to the FMOH report for 2012, and updated for 2015, there are only 47 SECU, 4 TECU and 579 PECU in country, including those PECUs run by IECWs. Considering the substantial gap in SECU and TECU facilities, at least 200 centers need to be established in total either by integrating existing General and Primary Hospitals as well as constructing new SECU when appropriate.

1. Primary Eye Care Unit (PUCU)

Definition:- Eye units run by either ophthalmic nurses or Integrated eye health workers delivering primarily preventive and promotive eye health services.

i. Place/Rooms:- at least one examination and one minor surgery room (mainly TT)

ii. Product/Equipment/instrument (essential) for PECU: Full trial sets (pin hole, frame and trail lens), VA chart ,Direct ophthalmoscope, Loupe +Torch light TT set(3), Minor set and Autoclave

iii. Professional: at least one ophthalmic nurse or IECW

iv. Practice: Eye health promotion, prevention and minor infection treatment. Additionally surgery performed and screen for URE, Cataract and vision threatening eye conductions.

1. Secondary Eye Care Unit (SECU)

Definition:- Secondary eye care services refer to providing a mix of preventive, curative and rehabilitative eye care interventions with a greater focus on curative services as to bring about a significant reduction in blindness and ocular morbidity in the service area.

i. Practice: Providing diagnostic and curative services for conditions such as: refractive errors, cataract, glaucoma, trachoma, trauma, lacrimal surgery, strabismus; diagnose and refer the following conditions to a tertiary eye hospital: complicated strabismus, disorders of the retina & vitreous, and conditions in children requiring advanced management.

ii. Place/Rooms:- 1 examination room, 1 Refraction room, 1 minor surgery room,1 major surgical room, 1 store

iii. Product: Equipment, instrument, and supplies: Tailored to the above listed services and as per IAPB list

iv. Professionals:- at least one ophthalmologist or cataract surgeons need to be available
Additionally Optometrist, ophthalmic nurses, and other required staffs.

In this strategic period, SECU establishment will be integrated in existing primary or general hospital in 50% of cases and construction of new facilities in 50%. A needs assessment will be conducted to gather data on the need

3. Tertiary Eye Care Unit (TECU)

Definition:- A referral center providing curative and rehabilitative ophthalmic services; deliver at least two subspecialty service; training for post graduate eye care professionals; conduct research regularly.

i. Place/ Rooms:- vary depending on the range of services but at least as per FMHCACA standard for Specialty center.

ii. Professionals:- at least two sub-specialists and as per FMHACA standard for Specialty center requirement

iii. Product: Equipment, instrument and supplies to be modified using the WHO and IAPB

iv. Practice: all curative and rehabilitative services as per the available sub-specialists and departments.

All TECU to have one optical workshop and 50% of SECU will have also optical workshops. All TECUs and SECUs have trained biomed technicians/engineers and TECUs may have a separate ophthalmic maintenance shop.

From the four current TECU (AAU-MF, Gondar, Hawassa and Jimma), AA-UMF is selected and supported to be center of excellence. The facility will deliver sub-specialty training and serves as the national institutes for advanced referrals and eye health resource facility. Three new TECU will be established and St. Paul's, Quhia and Harar hospitals supported to be upgraded from their current SECU level to TECU.

Table 18. Eye Health Infrastructure Development plan Ethiopia 2016-2020 G.C

Physical Facilities	Current	2016	2017	2018	2019	2020	Total
Tertiary Eye Unit (TECU)	4	0	1	1	1	0	7
Secondary Eye Unit (SECU)	47	3	10	12	13	15	100
Primary Eye Unit (PECU)	579	21	500	500	1000	1000	3,600
Optical Workshop	10	5	5	10	15	15	60
Postgraduate training facilities	3	0	2	0	1		7
Mid-level Eye Health training facilities	5	1	1	1	1	1	10
Sub-Specialty training Center	0	0	0	0	1	0	1
Ophthalmic and related equipment maintenance and training center in the center of excellence	0	0	0	1	0	0	1

Chapter Six: Partnership

Blindness is a major health problem in Ethiopia and it requires coordinated action and partnership. Therefore, establishment of effective partnerships is essential to the success of the prevention of blindness program objectives.

In order for partnerships to function and be sustainable, they must be institutionalized and recognized by political and administrative bodies at various levels. Coordination of partnership is of paramount importance within various departments of Ministry of Health at all levels, as well as sectors outside of health including private sectors. The FMOH and the National Eye Health TWG (NCPB) will oversee partnership and collaboration to ensure effective, equitable, and quality services delivery to the community at large. The following are major partners involved in the implementation of blindness prevention and control activities:

With-in the FMOH:

- NCD team
- NTD team
- PFSA
- FMHACA
- Human Resources Directorate
- Clinical Services Directorate

Out-side the FMOH:

Government Sectors:

- Ministry of Finance and Economic Development (MoFED):
- Ministry of Education (MoE):
- Communication media agencies
- Academic and research institutions:
- Science and Technology Ministry
- Custom Authority

Private Sectors:

- Private Eye Health and General Health care firms
- Private Medical and Pharmaceutical importers and pharmacies
- Private Biomedical workshops
- Private Optical Business firms

NGOs: *National*

- Gerarbet Tehadeso Maekel (GTM)
- Religious organizations Eye health facilities
- Eye Bank of Ethiopia
- Professional Associations (OSE, EOA, ECSA, EMA)
- Ethiopian Diabetic Associations
- Ethiopian Glaucoma Associations
- Lions Club
- Rotarians

International

Christian Blind Mission (CBM), The Fred Hollows Foundation (FHF), Help Age Int., Light for the World, Orbis Int, Vision Aid Overseas (VAO), Himalayan Cataract Project (HCP), International Trachoma Initiative (iTi), TCC, Menschen for Menschen, Vision Care, etc

Strategies for partnerships:

- Strengthening advocacy and lobby group
- Promoting public - private partnership
- Encouraging partnership forums
- Coordination and supervision through FMOH and other responsible bodies
- Strengthening the National Eye Health TWG (NCPB)
- Promote inter-organizational relationships (coordination, cooperation & collaboration) among actors engaged in eye health sector.

Chapter Seven: Research, Monitoring and Evaluation

A robust monitoring and evaluation (M&E) system that tracks and evaluates progress towards strategic objectives and informs strategic decision-making, is key to the goal of ‘quality eye health services for all Ethiopians and rehabilitative services for those who are visually impaired.’ The M&E system will routinely monitor and periodically evaluate results and implementation processes, with appropriate methods of data collection, data quality assessment, data management, data reporting as explained in the M&E section of the Health Sector Transformation Plan (HSTP), 2015/16 - 2019/20.

Performance monitoring and coordination activities for eye health service delivery will be carried out regularly in all the government structures of the health system. Eye health will be part and parcel of the Annual Review Meeting (ARM) of the health sector. In addition, RHBs will undertake an annual performance review meeting with Woredas, zones and regional and local stakeholders. During these meetings the strengths and challenges will be reviewed and future plans will be agreed upon. Furthermore, FMOH will conduct inspections to verify activities undertaken at grass roots level, and, based on the inspection results, measures will be taken to strengthen the system for eye health. Regular inspections will be a mechanism to verify routine reports as well as to promote accountability, ensuring compliance with agreed performance standards and targets and improvement of quality in the eye health care delivery.

Eye health research has been conducted over the past several years by Ethiopian and overseas professionals. The research was often focused on the interest and geographic area of the organization and was carried out to generate evidence on prevalence of diseases, pattern of diseases as well as mini estimation of blindness and low vision burden in the country. Additionally, post graduate students and scholars have conducted research for the fulfillment of the academic career. The national survey on blindness and low vision in Ethiopia conducted in 2005/2006 was the first ever national survey on eye health. The finding of this survey helped the eye health community to advocate for prioritization of eye health as general public health problem. Trachoma baseline surveys and post intervention impact surveys throughout all of Ethiopia have also been carried out by the government and implementing partners.

In this strategic plan period, a national survey on blindness and visual impairment, as well as specific disease prevalence surveys, is one of the major objectives scheduled by the FMOH and its stakeholders. Additionally, support for small scale research is planned if resources are available.

Mid-Term Review (MTR) and Final Evaluation of the strategic plan will be conducted in 2018 and 2021 respectively. It will be used to assess the level of achievement of the strategic objectives, identify challenges, document best practices, and forward recommendations to improve future governance, management and implementation of activities in order to meet the strategic goal.

Table 20 depicts the logical framework of the strategic plan for eye health in Ethiopia (2015/16 - 2019/20). It consists of the strategic objectives, intermediate results leading to the achievement of these objectives, and key activities to be conducted.

Table 19. Indicators for eye health

Indicators	Base line in	2016	2017	2018	2019	Target in 2020	Total	Source	Periodicity	Level of data collection	Responsible bodies
Cataract Surgeries per year	50,000	100,000	120,000	150,000	200,000	250,000	820,000	HMIS	Annually	Health facilities and partners	At all level
Cataract surgical rate per million people per year								HMIS	Annually	Health facilities and partners	At all level
Prevalence of TT percent	1.2% (GTMP)					<1%		Survey	3-5 years	population	FMOH, RHB, woreda
TF prevalence in 1-9 years old	27% (GTMP)					<5%		Survey	3-5 years	Population	FMOH, RHB, woreda
Total number of glaucoma cases on treatment		12,050	23,100	34,200	45,300	60,500	175,150	HMIS	Annually	Health facilities	FMOH,RHB, Health facilities
Total Number of people screened for		20,000	40,000	80,000	160,000	200,000	500,000	Admin report	Annually	Schools and Health facilities	At all level

Refractive Errors																				
Total # students screened at schools for Refractive Errors		10,000	20,000	40,000	80,000	100,000	250,000	schools	Annually	Schools	FMOH, RHB, Woreda health office									
Total # students received eye glasses		1000	2000	4000	8000	10,000	25,000	schools	Annually	Schools and Health facilities	FMOH, RHB, Woreda health office									
Number of People screened for DR		10,000	20,000	40,000	50,000	80,000	200,000	Admin report		Health Facilities	RHB, Health Facilities									
Number of People received service for DR		3600	6000	8750	10,600	16400	45,350	Admin report	Annually	Health Facilities	RHB, Health Facilities									
Number people surgically treated for corneal problem		250	500	1000	1500	1750	5,000	Admin report	Annually	Health facilities	RHB, Health Facilities									

Indicators	Base line in	2016	2017	2018	2019	Target in 2020	Total	Source	Periodicity	Level of data collection	Responsible bodies
Cataract Surgeries per year	50,000	100,000	120,000	150,000	200,000	250,000	820,000	HMIS	Annually	Health facilities and partners	At all level
Cataract surgical rate per million people per year	576	1032	1238	1508	1960	2388		HMIS	Annually	Health facilities and partners	At all level
Prevalence of TT percent	1.2% (GTMP)					<1%		Survey	3-5 years	population	FMOH, RHB, woreda
TF prevalence in 1-9 years old	27% (GTMP)					<5%		Survey	3-5 years	Population	FMOH, RHB, woreda
Total number of glaucoma cases on treatment		12,050	23,100	34,200	45,300	60,500	175,150	HMIS	Annually	Health facilities	FMOH,RHB, Health facilities
Total Number of people screened for Refractive Errors		20,000	40,000	80,000	160,000	200,000	500,000	Admin report	Annually	Schools and Health facilities	At all level

Total # students screened at schools for Refractive Errors		10,000	20,000	40,000	80,000	100,000	250,000	schools	Annually	Schools	FMOH, RHB, Woreda health office
Total Number of students received eye glasses		1000	2000	4000	8000	10,000	25,000	schools	Annually	Schools and Health facilities	FMOH, RHB, Woreda health office
Number of People screened for DR		10,000	20,000	40,000	50,000	80,000	200,000	Admin report		Health Facilities	RHB, Health Facilities
Number of People received service for DR		3600	6000	8750	10,600	16400	45,350	Admin report	Annually	Health Facilities	RHB, Health Facilities
Number people surgically treated for corneal problem		250	500	1000	1500	1750	5,000	Admin report	Annually	Health facilities	RHB, Health Facilities

Objectives	Intermediate results (IR)	Key Activities
<p>1. To empower and engage the community in eye health care so as to create sense of ownership, increase service utilization and adopt good eye health care practices</p>	<p>1.1 Improved community awareness and knowledge of available eye health services and their importance</p>	<ul style="list-style-type: none"> • Produce national guideline on eye health education to the public • Health facilities conduct regular eye health education sessions to patients with eye health problems and care givers • Develop key messages on eye health • Design standard IEC/BCC materials • Provide public information through local radio and television spots, and print media • Conduct advocacy events at national and regional levels (e.g. world sight day) • Conduct training to influential groups like teachers, HEWs/ HDAs, religious/ community leaders on primary eye health care, case identification and referrals • Trained teachers provide health education and screening to primary school students • Trained HEWs/HDAs provide eye health education and screening during house to house visits and small group discussions • Organize sensitization workshop on eye health to women and youth associations, non-ophthalmic officials in health facilities, religious leaders, elders... • Organize community awareness programs on eye banking and corneal grafting • Conduct a study on barriers for cataract surgery and design public awareness programs based on the findings
	<p>1.2Community involvement in case identification and referrals strengthened</p>	<ul style="list-style-type: none"> • Conduct training to religious/community leaders on primary eye care, case identification and referrals • Community members assist HEW/Teachers in case identifications • Community members engaged during campaigns and outreach eye health services
	<p>1.3Community engaged in process of planning, execution and evaluation in eye health activities</p>	<ul style="list-style-type: none"> • Conduct community forum on eye health • Incorporate the eye health agenda in the existing community structures • Best practice expanding
	<p>1.4Increased number of primary schools that conduct school screenings by trained teachers</p>	<ul style="list-style-type: none"> • Conduct training to teachers on screening of children for eye health problems • Establish and support school eye health clubs

Objectives	Intermediate results (IR)	Key Activities
2. To provide quality eye health care ^e and rehabilitative service	2.1 Health facilities have sufficient functional optical medical equipment and supplies to provide quality eye health services	<ul style="list-style-type: none"> • Procure and distribute essential optical medical equipment and supplies to eye care units • Conduct training to biomedical technicians/ engineers in ophthalmic equipment maintenance • Establish a system of preventive maintenance for optical medical equipment in health facilities
	2.2 Health facilities had enough space and trained eye care personnel to provide high quality eye health care services	<ul style="list-style-type: none"> • Advocate for the placement of required eye care personnel • Negotiate to have a separate in-patient and out-patient wards • Conduct basic/ refresher training to eye care personnel (ophthalmologists, non-doctor cataract surgeons, optometrists, ophthalmic nurses, ophthalmic officers, IECWs...) on relevant eye health topics (e.g. non doctor cataract surgeons in MSICS, ophthalmic nurses on management of Operation Theater and TT surgery, optometrists on RE management...) • Conduct IECWs training (on primary eye care, refractions, and TT surgery)
	2.3 Increased client satisfaction	<ul style="list-style-type: none"> • Conduct survey to assess client satisfaction of eye health services • Prepare standard operating procedure for eye health services • Devise an incentive mechanism to motivate eye care personnel • Supportive supervision and quality assurance mentoring • Conduct continuous cataract surgical outcome monitoring [using WHO recommended cataract audit system]
	2.4 Increased uptake of eye health care services	<ul style="list-style-type: none"> • Ensure the necessary trained eye care personnel, optical medical equipment and supplies for provision of quality eye health care services are available in health facilities delivering eye health care services • All awareness raising activities and trainings listed under objective 2 • All trainings to improve capacity of eye health care personnel listed under objective 4 • Conduct outreach for eye health care services • Conduct school screening by trained teachers • Enforce eye screening for drivers' license [national policy on eyesight and driving] • Strengthen early detection of eye health problems by eye health care providers at primary eye care units (e.g. screening of all new borns, opportunistic screening e.g OPD visitors)

Objectives	Intermediate results (IR)	Key Activities
		<ul style="list-style-type: none"> • Introduce new technology (smart phone, digital camera) in eye health care service delivery • Conduct training to ophthalmologists on DR surgery • Conduct training to ophthalmologists on corneal surgery • Integration of pediatricians in the eye care of children • Conduct baseline survey to assess current eye health care service use • Advocate for screening of all children entering primary schools
	2.5 Improved diagnostic and therapeutic facilities for eye health	<ul style="list-style-type: none"> • All trainings to improve capacity of eye health care personnel listed under objective 4 • All activities to improve infrastructure and logistics under objective 5
	2.6 Improved accessibility of eye health care services	<ul style="list-style-type: none"> • Establish new eye care units • Conduct outreach for eye health care services • Establish mobile eye clinics for pastoralist communities
	2.7 Strengthened referral system (community to PECU to SECUs to TECUs)	<ul style="list-style-type: none"> • Develop SOP for referrals • Develop bidirectional referrals system with timely feedback • Proper documentation of referrals with standardized formats • Conduct training to HEWs/ HDAs, teachers, religious/ community leaders on primary eye care, case identification and referrals
	2.8 Increased number of rehabilitative services for visually impaired	<ul style="list-style-type: none"> • establish school programs for the blind in existing schools • Establish low vision centers and optical workshops • Integration of visually impaired students with others • Equip schools with materials for students with special needs materials • Conduct training of teachers on special needs
3. To strengthen human resource capacity at all levels for effective delivery of eye health care services	3.1 Increased number of eye care personnel and allied ophthalmic personnel to population ratio	<ul style="list-style-type: none"> • Review IECWs' training manual • Conduct ICEW training (4-6 weeks) • Review HEWs package to include eye health • Conduct training of HEW (3-5 days) on eye health • Review teachers' PEC manual • Conduct training of teachers (3-5 days) • Review B.Sc. curriculum of ophthalmic nurses and advocate to be endorsed nationally • Advocate for integration of ophthalmic nurses training in the existing curriculum of training institutes • Expand fellowship/M.SC of optometry

Objectives	Intermediate results (IR)	Key Activities
		<ul style="list-style-type: none"> • Advocate for increase in enrollment of ophthalmologists, ophthalmic nurses, optometrists in the existing training institutes • Advocate for opening of new ophthalmology training centers • Develop ophthalmology sub-specialty curriculum • Advocate for commencement of ophthalmology sub-specialty training • Develop eye health manager training curriculum • Advocate for opening of eye health managers training • Develop optical technicians curriculum • Advocate for opening of optical technicians training
	3.2 Decreased attrition rate of eye health care professionals	<ul style="list-style-type: none"> • Advocate for motivational incentives packages for eye health care personnel • Design a career structure
	3.3 Standardized (number and mix of) eye care personnel required for health facilities	<ul style="list-style-type: none"> • Ensure a standardized number and mix of eye care personnel in the national HRH plan
4. To improve and maintain appropriate infrastructure and logistics for provision of sustainable eye health care services in the national, regional, districts and community levels	4.1 Increased number of eye care units	<ul style="list-style-type: none"> • Renovation and expansion of rooms • Identify potential health centers and hospitals for expansion of eye health services
	4.2 Sustainable medical supplies for eye health	<ul style="list-style-type: none"> • PFSA quantification and discussion • Procure and distribute essential optical medical equipment and supplies • Promote private importers • Discussion with FMHCACA for donated supplies • Ensure availability of essential drugs
	4.3 Have functional medical equipment at all health facilities providing eye health services	<ul style="list-style-type: none"> • Provide training to biomedical technicians/ engineers in ophthalmic equipment maintenance • Establish a system of preventive equipment maintenance • Conduct training for end users • Establish national optical workshop

Objectives	Intermediate results (IR)	Key Activities
5. To enhance partnership across all stakeholders for harmonization and alignment of eye health activities	5.1 Integrated eye health services with various stakeholders (governmental, NGOs, private institutions...)	<ul style="list-style-type: none"> • Conduct regular annual review and TWG meeting • Encourage various forum • Provide technical support to private eye sectors • Work towards public private partnership • Ensure eye health reports for the private sectors are incorporated in the national reports
6. Generating evidence and enhance systems of monitoring and evaluation of eye health care services at all levels for informed decision making	6.1 Research conducted to inform eye health care stakeholders	<ul style="list-style-type: none"> • Conduct national survey on blindness and low vision • Support and promote research by professionals • Encourage sharing of research findings in conferences • Identify priority eye health focus areas for a research
	6.2 Improved capacity for eye care research	<ul style="list-style-type: none"> • Establish a national eye care resource and research center • Organize short term training on research methodology
	6.3 Additional eye health indicators included in the national HMIS	<ul style="list-style-type: none"> • Advocate for review of HMIS indicators
	6.4 Improved data collection and reporting system	<ul style="list-style-type: none"> • Develop/ revise registers for eye health services • Ensure inclusion of eye health indicators in the current HMIS reporting from health centers and hospitals
	6.5 Eye health included in government's semiannual Integrated Supportive Supervision (ISS)	<ul style="list-style-type: none"> • Ensure (Integrated Supportive Supervision) ISS checklist includes eye health • Participate in semiannual ISS
	6.6 Improved data quality on eye health service use reports	<ul style="list-style-type: none"> • Conduct data quality checks during ISS and follow-up visits to sites • Conduct DQA on annual basis
	6.7 Strategic plan evaluated at midterm and end term	<ul style="list-style-type: none"> • Conduct midterm/ end term evaluation plan by an external consultant

Objectives	Intermediate results (IR)	Key Activities
7. To Improve eye health governance and ownership at all levels in the government structures	7.1 Eye health plan aligned/ harmonized with the general health plan	<ul style="list-style-type: none"> • Develop/ update national policies and operation plan and cascade across all levels • Ensure eye health plan is incorporated in the general health plan at all government levels (FMOH, regional, zonal, woreda, health facilities)
	7.2 Improved budget allocation for eye health services	<ul style="list-style-type: none"> • Mobilize and allocate budget for eye health • Periodic review of annual budget plan
	7.3 Key eye health indicators captured in the national HMIS	<ul style="list-style-type: none"> • List out key eye health indicators to be included in the HMIS • Develop and/or revise HMIS registers and reporting formats to capture key eye health indicators • Eye health indicators incorporated within the national disease burden indicators for health services
	7.4 Eye health service delivery data used by decision makers for improving the service	<ul style="list-style-type: none"> • Prepare and submit quarterly progress reports • Supportive supervision visits to health facilities providing eye health services • Conduct quarterly/ annual review meetings • Provide regular feedback to concerned bodies
	7.5 Eye care case team/ focal person be in place in the government structure at all levels	<ul style="list-style-type: none"> • Develop working guideline of case team/ focal person • Liaise with regional and local government to assign appropriate personal • Assign/establish focal person/case team

^ Each strategic objective has intermediate results leading to the achievement of the objective.

£ Activities and indicators relevant to **trachoma** are detailed in the national master plan for neglected tropical diseases (NTDs).

Table 21. FMOH Eye Health Strategic Plan 2016-2020 G.C

	Current	2016	2017	2018	2019	2020	Total
All Cataract Surgeries	50,000	100,000	120,000	150,000	200,000	250,000	820,000
Cataract surgical Rate (CSR)	500	0				>2000	
All Glaucoma Services							190,150
Total patients on follow up Medical RX		10,000	20,000	30,000	40,000	50,000	150,000
Newly Diagnosed Cases		2,000	3,000	4,000	5,000	10,000	24,000
Total Adult surgeries		1,000	2,000	3,000	4,000	5,000	15,000
Laser services		50	100	200	300	500	1,150
All Refractive Error services							
Total # of adults screened for Refractive Errors		10,000	20,000	40,000	80,000	100,000	250,000
Total # adults received eye glasses		10,000	20,000	40,000	80,000	100,000	250,000
All corneal services							
(total 5,000)	Cornea trauma	PKP	300	350	500	600	2,000
		750	700	650	500	400	3,000
All Retina services							
# Health facilities screening DR	5	10	20	25	30	50	140
# of People screened for DR		10,000	20,000	40,000	50,000	80,000	200,000
# of People Laser RX for DR		1,000	2,000	4,000	5,000	8,000	20,000
# of people surgically treated for DR		100	200	250	300	500	1,350
# of people medically injected for DR		1,000	2,000	2,500	3,000	5,000	13,500
# of people diagnosed with RD		1,000	1,200	1,300	1,500	2,000	7,000
# of people surgically treated for RD		500	600	700	800	900	3,500
# of people diagnosed with AMD		500	600	700	800	900	3,500
# of people treated for AMD		500	600	700	800	900	3,500

Annexes

Annex 1: Disease control plan

Table 22: Childhood blindness/child eye health

Disease	Current	2016	2017	2018	2019	2020	Total
Pediatric cataracts surgeries		500	1000	1500	2000	2500	7,500
Other pediatric Surgeries		500	600	900	1000	2000	5000
Total # schools performing screening		50	100	200	400	1000	1,750
Total # students screened at schools		10,000	20,000	40,000	80,000	100,000	250,000
Total # students received eye glasses		1,000	2,000	4,000	8,000	10,000	25,000
# of children screened for ROP		10	20	40	50	100	220
# of children treated for ROP		5	10	20	30	80	145

Annex 2: Equipment need for 5 years

Annex 2.1: Equipment need for 5 years existing and new SECU/TECU

Major equipment	Price/pc USD	2016	2017	2018	2019	2020	Total
Slit lamp microscope (SLM)	7,000(Scanoptic,Hagg,	6	20	24	26	30	106
Operating Microscopes	8,000 Leica	6	20	24	26	30	106
Yag Lasers	16,000 Appasamy	0	5	6	6	8	25
Retina Diod lasers	17,000 App	2	2	2	2	2	10
Phaco machines	16,000 Appasamy	1	1	2	2	2	8
Posterior Vitrectomy Machines	27,000 Appasamy	0	1	1	2	2	6
Anterior Vitrectomy Machines	2,000 Appasamy	6	20	24	26	30	106
Autorefractometers	5,000	3	10	12	13	15	53
Visual field Analyzers	8,000	3	10	12	13	15	53
Anesthesia machines	15,000	1	1	2	2	2	8
Retinoscopes	850	50	60	60	60	70	300
Trail sets	1,500	100	200	400	400	400	1,500
Ophthalmoscopes	850	100	200	400	400	400	1,500
As scan	3,500 Appasamy	6	20	20	26	30	106
Keratometer	10,000 Appasamy	6	20	20	26	30	106
90 D lenses	400	6	20	20	26	30	106
Cataract sets	1,500	60	80	96	260	300	1060
Glaucoma sets	1,200	12	40	48	52	60	212
RD and vitrectomy sets	2,000	0	0	10	20	26	56

Major equipment	Price/pc USD	2016	2017	2018	2019	2020	Total
Strabotomy sets	1,000	6	20	24	26	30	106
Orbitotomy sets	2,000	12	40	48	52	60	212
Minor/TT sets	300	1000	1000	1000	1000	1000	5,000
Schiotz Tonometer	100	300	300	300	300	300	1,500
Goldman Tonometer	200	20	20	20	20	20	100
Tonopen	2,500	4	5	5	5	5	24
B-scan	10,000 Sonomed	10	10	10	10	10	50
PKP Sets	2,000	10	10	10	10	10	50
Cryomachines	10,000 Keeler	0	0	10	20	26	56
Indirect Ophthalmoscopes	1,600 Keeler, Henin	0	0	30	30	46	106
Fundus Camera	6,000 Topcon, Henin	0	0	30	30	46	106
OCT	27,000 Appasamy	0	0	2	2	2	6
Lensometer		0	0	30	36	40	106
Operating Table		0	3	30	33	40	106

Some secondary and all TECU

Tertiary centers only

Annex 2.2: Equipment and supplies need for 5 years existing and new PECU

Major equipment	Price/pc USD	200	200	2010	2011	2012	Total
Acrlight Package (Ophthalmoscope, Loup, Oscope etc)	10 USD	0	0	1,000	1,600	2,000	3,600
Trail sets	1,500	0	0	1,000	1,600	2,000	3,600
Minor/TT sets	300	0	0	3,000	4,800	6,000	10,800
Schriots Tonometer	100	0	0	1,000	1,600	2,000	3,600
VA Charts Near+ D	10	0	0	3,000	4,800	6,000	10,800
Autoclaves	500	0	0	1,000	1,600	2,00	3,600
Major Supplies							
TTC ointment	0.5	0	0	1,000,00	1,600,00	2,000,00	3,600,00
				0	0	0	0
Lidocaien	2	0	0	50,000	70,000	100,000	220,000
CAF ointments	1	0	0	50,000	70,000	100,00	220,00
4.0 Silk Sutures	2	0	0	100,000	120,000	130,00	250,000
PECU Equipment=							
supplies =							

Annex 2.3 : Equipment need for Center of excellence for 5 years

Major equipment	Price/pc USD	2008	2009	2010	2011	2012	Total	Total Price
SLM	7,000(Scanoptic, Hagg,	0	0	5	7	8	20	140,000
Operating Microscopes	Tagiegaki 25,000	0	0	2	4	6	10	250,000
Yag Lasers multimodal	48,000 lightmed	0	0	0	1	1	2	96,000
Retina Green lasers	39 ,000 Lightmed	0	0	0	1	1	2	78,000
Phaco machines	25,000	0	0	0	1	1	2	50,000
Posterior Vitrectomy Machines	40,000	0	0	0	1	1	2	80,000
Anterior Vitrectomy Machines	2,000 Appsamy	0	0	2	4	4	6	12,000
Autorefractometers	5,000	0	0	2	3	1	6	30,000
Visual field Analyzers	8,000	0	0	0	1	1	2	16,000
Anesthesia machines	15,000	0	0	1	1	1	3	45,000
Retinoscopes	850	0	0	5	10	10	25	21,250
Trail sets	1,500	0	0	5	5	5	15	22,500
Ophthalmoscopes	850	0	0	5	10	10	25	21,250
As scan	5700 Sonomed	0	0	0	1	1	2	11,400
Keratometer	10,000 Tomy	0	0	0	1	1	2	20,000
90 D lenses	400	0	0	10	10	10	30	12,000
Cataract sets	1,500	0	0	10	10	10	30	45,000
Glaucoma sets	1,200	0	0	5	5	5	15	18,000
RD and vitrectomy sets	2,000	0	0	0	5	5	10	20,000
Strabotomy sets	1,000	0	0	4	6	5	15	15,000
Orbitotomy sets	2,000	0	0	4	5	6	15	30,000
Minor/TT sets	300	0	0	10	10	10	30	9,000
Goldman Tonometer	200	0	0	5	5	5	15	3,000
Tonopen/Icare	2,500	0	0	5	5	5	15	37,500
B-scan	10,000 Sonomed	0	0	0	1	1	2	20,000
PKP Sets	2,000	0	0	0	5	5	10	20,000
Cryomachines	10,000 Keeler	0	0	1	1	1	3	30,000
Indirect Ophthalmoscopes	1,600 Keeler, Henin	0	0	3	3	4	10	16,000
Fundus Camera	25,000 Topcon, Henin	0	0	1	0	1	2	50,000
OCT	60,000 Optuvue	0	0	0	1	0	1	60,000
Lensometer	1,000	0	0	3	3	4	10	10,000

Operating Table	5,000	0	0	3	3	4	10	50,000
Cross linking Machine	20,000	0	0	0	1	0	1	20,000
Total Equipment USD								1,358,900

Optical Workshop = 30,000 USD, Equipment maintenance workshop= 20,000 and Resource center= 30,000 = Total center of excellence =1,438,900 UcSD= 33,094,700 ETB

Annex 3:costing

Major activities		Year I	Year II	Year III	Year IV	Year IV	Total cost	From partners	From Government
1. <u>Disease Control</u>									
<u>1.1 Cataract</u>		2016	2017	2018	2019	2020			
-	Physical Plan in number greater than 2000	100,000	120,000	150,000	200,000	250,000			
-	Financial Plan in Million ETB	631.915	737.234	842.552	947.871	1,053.190	3,159.572	30%	70%
<u>1.2 Glaucoma</u>									
-	Increase awareness and case detection from the base year	10%	15%	20%	25%	30%			
-	Financial plan in Millions ETB	0.85	0.95	1.15	1.25	1.5	5.7	50%	50%
<u>1.3. Diabetic retinopathy</u>									
-	Increase awareness and case detection to 70%over the base line	10%	15%	20%	25%	30%			
	Financial plan in Millions ETB	0.75	0.85	0.95	1.0	1.25	4.8	20%	80%
<u>1.4 Childhood blindness</u>									
-	Train 25,000 teachers for school screening	4,000	4,500	5,000	5,500	6,000			
	Financial plan in millions ETB	2.5	3.0	3.5	4.0	4.5	17.5	50%	50%

1.5 Screen 250,000 school children 7-15 years old for refractive errors and Spectacles provision for 25,000 children from those screened children	Physical plan for screening	10,000	20,000	40,000	80,000	100,000				
	Physical plan for spectacle provision	1000	2000	4000	8000	10,000				
1.6 Supportive supervision to 9 regions by the FMOH	Financial plan	2.5	3.25	3.5	3.75	4.0	17	20%	80%	
	Physical plan		2	3		4				
1.7 NCPB meeting	Financial pan in Millions ETB		0.4	0.6		0.8	1.8	50%	50%	
	Financial plan in Millions ETB	0.2	0.25	0.3	0.325	0.35	1.075	10%	90%	
1.8 Midterm and final evaluation of the strategic plan	Physical plan			1		1				
	Financial plan in Millions			1.25		1.45	2.7	50%	50%	
1.9 National survey on blindness and low vision	Physical plan			1						
	Financial plan in million		8.5	-	-	-	8.5	80%	20%	
2. Human resource Development	Financial plan in Millions		15.5	20.5	25.5	30.5	104.25	20%	80%	
	Financial plan in millions	15.25	20.5	22.5	20.5	15.5	94.25	20%	80%	
3. Infrastructure development, instrument and equipment										
<u>Grand Total in Millions</u>							257.575 +3,159,829.572 =3,160,087.147			

