

## Eye Care and Sustainable Development

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### Abstract

*Vision is not only critical to an individual's growth and development but also has direct implications for national and global development. It holds the potential to boost the global economy in a fair and equitable manner. It enables everyone to live their lives to the fullest, releasing their potential to learn, work, and lead fulfilled and productive lives. This paper examines the direct and indirect implications of eye health care on the attainment of the United Nations Sustainable Development Goals, thereby making it contingent upon policymakers to invest in the 'vision for all'. The study proposes urgent policy interventions for creating integrated people-centered eye care, embedded in health systems and based on strong primary health care, and scaled and decentralized to the grassroots level in India. It emphasizes eye care in local governance -especially below the district level for effective implementation.*

**Keywords:** Eye Care; Well-Being; Health Policy; Sustainable Development Goals; Vision for All

### Introduction

Our eyes are the locus of primary access to the world around us. They allow us to interact with it and facilitate physical, emotional, and mental well-being. Vision loss and impairment affect more than how people see; it has implications for inequities in employment, healthcare access, and income. Thus, ensuring the eye health of the people of every nation is a key component of policymaking. Vision makes an important contribution to the 2030 Agenda for Sustainable Development and has been aligned with the attainment of each of the 17 Sustainable Development Goals (SDGs) listed by the United Nations (UN). The inherent rationale behind this is that without proper vision and eyesight, the people remain lacking in contributing their bit towards the 2030 Agenda.

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According to the World Health Organization (WHO), 80% of all causes of visual impairment are preventable or curable. Yet many populations do not have access to good-quality, affordable eye care. This is accurate for India as well. The provision of effective and accessible eye care services is the key to effectively controlling visual impairment, including blindness.

India, being a geographically and socio-economically diverse country, faces deprivation in terms of access to necessities, education, and health. Among these, the focus allotted to eye health care remains in abeyance. There exists neglect of accessibility, availability, and affordability.

The government's efforts need to be particularly targeted at the Indian population, and a study to precede an eye-care policy is needed. This would evidence the actual need, types of eye-health problems, and necessary steps for rectification of such problems. Such a study of the actual prevailing status of eye care would be a pioneering one, and go a long way in establishing the need for investment in eye care across the world towards the attainment of SDGs of the UN.

Hence, the overriding understanding is that the attainment of the SDGs is contingent upon the good eye health of the populace, and all problems relating to vision and eyesight need urgent corrective actions. This further translates into the need for every government to invest, among other areas, more proactively towards strengthening eye care services, such that these are affordable, accessible, and available for all. In other words, the *eye health security* of the entire population is ensured. Therefore, it is pertinent to establish the enormity of the significance of eye health for every human being and critical that countries adopt a comprehensive approach to vision and include eye health in their implementation of the SDGs at the national level.

### **Prioritizing Eye Health: Rationale and Motivation**

The World Health Organization (WHO) and the International Agency for the Prevention of Blindness (IAPB) recognized sight as a 'right' and launched the *VISION 2020: The Right to Sight* initiative in 1999. It aimed to eliminate avoidable blindness in the world by 2020 and targeted the world's leading causes of avoidable visual impairment, i.e., cataracts, trachoma, onchocerciasis, childhood blindness (including Vitamin-A deficiency), refractive error and low vision (Pararajasegaram, 1999). Committed to reducing the burden of preventable blindness by 2020, the NGO "Right to Sight" India, was founded in May 2004 as a confederation parallel to the international body (Deshpande, 2008). It aimed to provide support to those with avoidable vision loss and ensure that efficient and cost-effective interventions are accessible. *VISION 2020: The Right to Sight - INDIA* is a registered not-for-profit forum and is a key driver of the global initiative of the World Health Organization (WHO) and the International Agency for the Prevention of Blindness (IAPB) for reducing avoidable visual impairment by the year 2020. It is a collaborative effort of INGOs, NGOs, eye care organizations in India, and the Government to coordinate and advocate for improved eye care programs; to gain and share knowledge and together develop solutions to achieve quality, comprehensive and equitable eye care.

As per the World Report on Vision 2019, approximately 2.2 billion people across the world suffer from vision impairment or blindness. Of these, at least a billion people have a vision impairment that could have been prevented or are yet to be addressed (World Health Organization, 2019). According to their evaluations, 90% of vision loss is concentrated in low- and middle-income countries, with the poor and vulnerable segments being disproportionately impacted in availability, access, affordability, and quality (ibid).

Further, a 2021 Seva Foundation report, 'The Economic and Social Cost of Visual Impairment and Blindness in India', estimates the economic and social costs of moderate and severe visual impairment (MSVI) and blindness in India, at INR 1,158 billion or \$ 54.4 billion. A more conservative estimate focusing only on employment loss and elevated mortality risk yields a cost of INR 504 billion or \$ 23.7 billion. Overall, the results show that poor eye health imposes a non-trivial recurring cost to the Indian economy equivalent to 0.47% to 0.70% of GDP in the primary scenario, a substantial constraint on the country's growth aspirations. The costs of poor eye health will increase over time as India ages and becomes wealthier unless further progress is made in reducing the prevalence of MSVI and blindness (Wong et al., 2019).

According to the estimates of the IAPB, vision loss costs the global economy \$411 billion every year in lost productivity alone (IAPB, 2021). Further, as almost everyone will need access to eye care services during their lifetime, the per annum productivity loss is only expected to increase, unless there is a significant investment in eye care services. Thus the SDG 1 of No Poverty is impacted since a person's impoverishment is both a cause and a consequence of poor eye health, and hence the poor and extremely poor are among the furthest left behind. Thus, the SDG objective of 'leaving no one behind' remains far-fetched.

Further, improved eye health increases access to wider and more frequent employment opportunities and subsequently increases household income and thereby reducing hunger and would contribute to the attainment of SDG 2 of Zero Hunger. It has been estimated that access to free and high-quality cataract surgeries can increase household income. For instance, 46% of households moved up an income bracket following cataract surgery (Friends of Vision and IAPB, 2021). This is true for India. For instance, the provision of free spectacles to tea workers with presbyopia in India improved workplace relative productivity (Reddy et al., 2018).

Implementing effective eye health services would be a way to break the negative cycle of poor eye health, which leads to poverty, leading to worse eye health, and thus more poverty (Marques et al., 2020).

It is clear that eye health is imperative for the overall good health, mental health, and complete well-being of an individual. Hence the challenges posed by poor eye health increase the risk of sicknesses and even mortality by up to 2.6 times (Wallace et al., 2020). In India, there is one ophthalmologist per 100,000 people. While around 70% of our population lives in villages, more than 90% of ophthalmologists live in cities. India also has a shortage of paramedics with less than 2 paramedics per ophthalmologist as against the WHO recommendation of 5 (Sabherwal, 2022). Thus, the SDG 3 of Good Health and Well-Being is impacted. The

effects of improved eye health cascade beyond poverty reduction, to achieve wider benefits, such as improved health and well-being (SDG 3), and education (SDG 4).

SDG 4 of Quality Education is contingent upon the eye and overall health of children and learners of all ages. Since vision is the foundation of a child's communication and learning skills and ability to become independent, therefore, there should be a strong focus on a vision for the children so that they can benefit from quality education. According to VISION 2020/IAPB, it is estimated that around 91 million children and adolescents worldwide have a vision impairment but do not have access to the eye care services they need, which leads to them being 2-5 times less likely to be formal education, especially in low- and middle-income countries. The COVID-19 pandemic-induced shifts in living standards and mode of education, have further increased the burden of children's eye care which risks the attainment of SDG 4 in a timely manner. Studies have shown how the provision of free spectacles to children is an inexpensive, simple intervention that can improve academic test scores and literacy skills, which in turn can improve future opportunities for decent work and paid employment.

A lack of access to eye care has a disproportionate impact on women and girls. This can have devastating consequences on girls' education, increase dropouts, exacerbate poverty and the occurrence of child marriage, and negatively impact the participation of women in the workforce and the role of women in safeguarding the health and education of their own children (Steinmetz et al. 2021). The Vision Loss Expert Group (VLEG) and Global Burden of Disease study (GBD) 2020 model (VLEG/GBD 2020 model) estimates that women and girls are 12% more likely than their male counterparts to have vision ailments and experience additional barriers in accessing eye care services. Thus, this puts the SDG 5 of Gender Equality at risk of being pushed to the margins.

SDG 8 calls for Decent Work and Economic Growth, the achievement of which can be constrained when employees do not have access to eye health care at the workplace. For instance, evidence from Kenya, The Philippines, and Bangladesh indicates that cataract surgeries can increase per capita household expenditure by 36%-88% (Kuper et al., 2010). Cataract surgeries if sponsored by employers could thus contribute to improvement in working and living standards. Findings from a study called PROSPER [PROductivity Study of Presbyopia Elimination in Rural-dwellers] further show that the provision of eyeglasses can increase workplace productivity by 22%, based on a trial of Indian tea workers with presbyopia (Reddy et al., 2018).

Studies have evidenced that socioeconomic status measured as lower incomes, lower educational status, or manual occupational social class is directly associated with the prevalence of blindness or visual impairment. Further, those living in rural areas are more likely to be associated with visual impairment and blindness (Ulldemolins, 2012). Thus, this exacerbates inequalities across several parameters. Thus, it needs to be ensured that eye care services should be accessible by all regardless of age, gender, race, caste, religion, location, or ability to pay. It is highly imperative to focus on eye care to improve our productivity and reduce the overall burden of healthcare on families as well as the economy at large so that we can move towards the attainment of the SDG 10 of Reduced Inequalities.

With growing urbanization and increasing population, there has been an increase in the number of vehicles on road. Eye health is essential for the achievement of SDG 11 of Sustainable Cities and Communities, which if ensured would be critical in reducing road traffic deaths and injuries. The VLEG/GBD 2020 model highlights that unoperated cataracts can increase the chance of a motor vehicle accident by 2.5 times, hence leading to further health challenges, disabilities, increased unplanned expenditures, and even mortalities. Vision impairment is not simply limited to visual acuity, but also includes visual field and color vision problems and impacts driving safety (Burton et al. 2020). Studies have demonstrated that cataract surgery reduced driving-related difficulties and motor vehicle collisions (Schelenker, 2018). Further, addressing this challenge would promote longevity and advance the pathways to achieving Sustainable Development Goals (Elrich et al., 2021).

Therefore, given the wide-reaching and intricate relationship between eye health and the growth and well-being of the populace, the issue must become a priority for policymakers, academics, civil societies and NGOs, and the private sector.

### **Eye Healthcare and Sustainable Development in India: Issues and Challenges**

The Vision 2020: Right to Sight was launched as a collaborative movement by WHO and IAPB in the year 2000 and culminated in the year 2020. In 2007, there were an estimated 12 million blind people in India (Vision 2020 India Newsletter, 2007) and in 2019, the National Blindness and Visual Impairment Survey revealed that around 4.8 million people were estimated to be suffering from blindness in India (Sharma, 2019). On the face of it as the data shows, there is an impressive decline of 47% of blind people in the country with the implementation of a series of measures under the ongoing NPCBVI (Kumar and Vashishth, 2020). However, in absolute numbers, the number of people suffering from blindness continues to be large, along with the 34 million faced with other visual impairments in the country.

It is important to note that for the year 2020, IAPB, on the basis of the VLEG/GBD 2020 model, reports that in 2020 in India, there were an estimated 270 million people with vision loss, of which, 9.2 million people were blind.

As per the Status of Child Eye Health Report by Orbis (2020), the economic burden of visual impairment in India accounted for roughly Rs 88,900 crore in 2020. The loss in income due to blindness in adults is estimated to be Rs 9,06,200 crore and Rs 3,31,100 crore for children, for 10 and 40 lost working years, respectively. This clearly indicates the consequent implications of unplanned expenditures on eye health thereby creating financial challenges for the people. This implies that the realization of SDG 1 of No Poverty remains a distant dream and monetary challenges may translate into becoming a roadblock to the attainment of SDG 2 of Zero Hunger as well.

The report highlights that there are approximately 270,000 blind children in India, the largest in any country across the world. Given that the books and mode of teaching remain dependent on visual aspects, the achievement of the Right to Education objective of providing affordable and quality education becomes difficult (Goal: 4). While support in terms of Braille text, audio textbooks, special educators, among other tools are being undertaken, they are far from being ubiquitous.

Further, the COVID-19 induced challenges translated into the online mode of teaching-learning, which further alienated a large section of the student population due to the inability to afford smartphones, tablets, and laptops/computers. This also had another dimension of visual impairments, eye strain, and sleep disturbance for a large number of students who found themselves struggling to learn in front of a digital screen. Additional health concerns include mental health problems ranging from difficulties in concentration, obsession to diagnosable mental illnesses such as anxiety, depression and attention-deficit hyperactivity disorder (Király et al., 2020; Meyer et al., 2020; Stavridou et al., 2021). Hence, the SDG 4 of Quality Education is a challenge in India in the prevailing context.

India is making all efforts to attain Goal 5 of Gender Equality. However, when it comes to equitable and equal eye health care, women are found to be at a disadvantage, thus making it difficult to achieve Goal 5. For instance, it has been reported that Indian women are 69% more likely to develop a cataract than men and 35% more likely to go blind to it. They have had 27% lower odds of getting cataract surgery than men, which is a significant cause of the resulting blindness. Some of the reasons for this gender disparity are the high costs of cataract surgeries, loss of work for the patient and their attendant during the surgery, and unwillingness to a hospital stay following the surgery because women have low disposable income and less financial control over their household income, as well as gendered restrictions placed on traveling outside villages and lack of community awareness about the procedure (Prasad, et al. 2020; Pant et al., 2017).

These further increases other disparities across age, geography, income, and other socio-economic categories and impact the attainment of Goal 10 of Reduced Inequalities. For instance, according to the National Blindness and Visual Impairment Survey India 2015-2019 (2019), the prevalence of blindness is highest among those who are at least 80 years old (11.6%). India, with a per capita public expenditure on health of just over 3% of GDP, lags behind the WHO recommendation for countries to spend 4-5% of their GDP on health to achieve universal healthcare. Thus, by ensuring a larger and a dedicated budget for eye health care, India could ensure making eye care a priority with a focus on the prevention and treatment of eye diseases, and rehabilitation, in order to converge with the United Nations resolution on “Vision for Everyone: accelerating action to achieve the Sustainable Development Goals” (UN General Assembly, 2021).

### **Mapping Sustainable Development Goals and Eye Care**

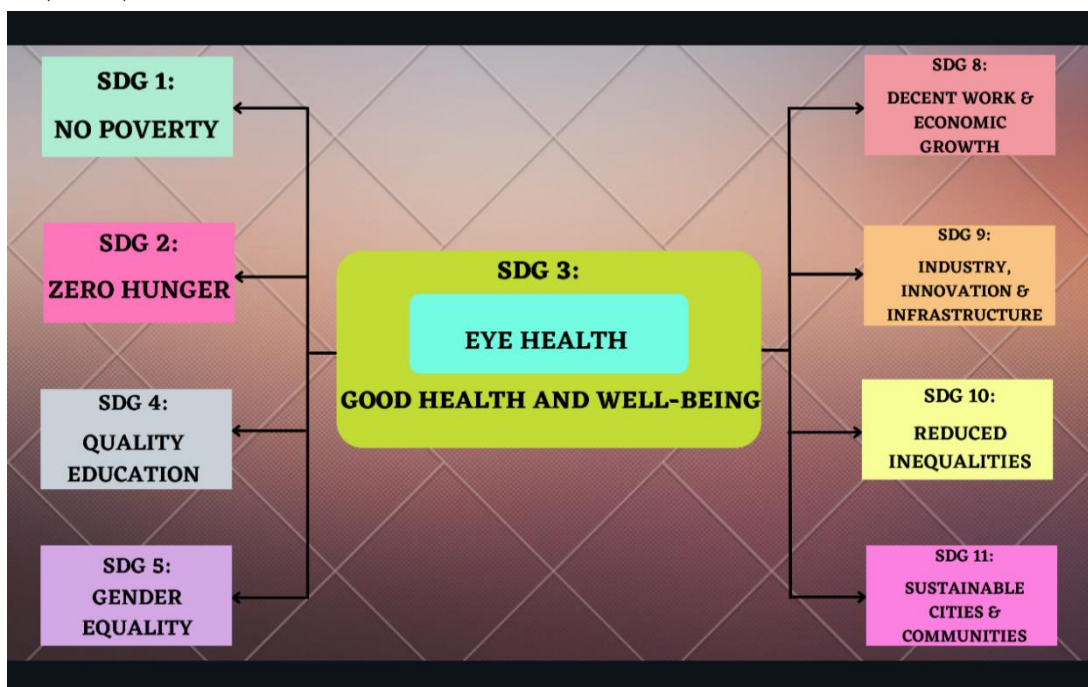
According to the Lancet Global Health Commission on Global Eye Health, eye health is defined as the state when vision, ocular health, and functional ability are maximized, which then contributes to overall health and wellbeing, social inclusion, and quality of life (Burton et al., 2021). Thus, impaired eye health negatively impacts the quality of life, an important measure of physical, emotional, and social well-being of the affected people, and also represents a major public health challenge, and is thus a substantial barrier to sustainable development (Assi, 2021). Lower quality of life has been evidenced due to vision impairment, age-related macular degeneration, glaucoma, diabetic retinopathy, or Mendelian eye conditions (including retinitis pigmentosa) (ibid).

It is simple and needs no explanation that eye health is intertwined with the overall health and well-being of an individual or with achieving the SDG 3 of Good Health and Well-Being. Promoting eye health and nuanced eye health policies and services not just helps those who are affected and enhances their functional ability but also leads to the advancement of multiple SDGs. These policies and services encompass the whole range of interventions that improve eye health, including promotion, prevention, treatment, and rehabilitation (WHO, 2019).

For the poverty-related SDGs (1, 2, and 8), studies show that the main pathways by which eye health services contribute to the advancement of these SDGs are through improvement in one or more of workplace productivity, household per capita expenditure, household income, employment rates, and economic productivity. For education (SDG 4), eye health services were found to contribute to improved academic test scores. This also drives SDG 9 by fostering greater innovation and contributes to the expansion of the industries and as well as infrastructure and by increased participation of the people there. For equality (SDGs 5 and 10), eye health services eliminated gaps in per capita expenditure. For sustainable cities (SDG 11), eye health services were found to reduce driving-related difficulties and motor vehicle crashes.

The major Goals that are directly impacted by the nature of eye health of the people include 1 (No poverty); 2 (Zero hunger); 3 (Good health and well-being); 4 (Quality education); 5 (Gender equality); 8 (Decent work and economic growth), and 10 (Reducing inequality) and 10 and 11 (industry, innovation, infrastructure and sustainable cities). The diagrammatic representation in Figure 1 below showcases the direct interlinkages between eye health and SDGs.

Figure 1: Interlinkages between eye health and Sustainable Development Goals (SDGs)



Some public interventions that are feasible and would lead to the advancement of the aforementioned goals are given in Figure 2.

Figure 2: Feasible Public Interventions towards Attainment of SDGs

(Adapted from Global Eye Health: vision beyond 2020)

Cataract Surgery	SDG 1: NO POVERTY	SDG 2: ZERO HUNGER	SDG 8: DECENT WORK & ECONOMIC GROWTH	SDG 9: INDUSTRY, INNOVATION & INFRASTRUCTURE	SDG 11: SUSTAINABLE CITIES & COMMUNITIES
Free Spectacles	SDG 1: NO POVERTY	SDG 2: ZERO HUNGER	SDG 4: QUALITY EDUCATION	SDG 8: DECENT WORK & ECONOMIC GROWTH	SDG 9: INDUSTRY, INNOVATION & INFRASTRUCTURE
Specialized Schools	SDG 1: NO POVERTY	SDG 2: ZERO HUNGER	SDG 4: QUALITY EDUCATION	SDG 8: DECENT WORK & ECONOMIC GROWTH	
Low-cost Eye Services	SDG 4: QUALITY EDUCATION	SDG 5: GENDER EQUALITY	SDG 9: INDUSTRY, INNOVATION & INFRASTRUCTURE	SDG 10: REDUCED INEQUALITIES	
Regular Eye Check-ups	SDG 4: QUALITY EDUCATION	SDG 8: DECENT WORK & ECONOMIC GROWTH	SDG 9: INDUSTRY, INNOVATION & INFRASTRUCTURE	SDG 10: REDUCED INEQUALITIES	

### An Assessment of the Eye Care Sector for Enabling Sustainable Development in India: Focusing on *Leaving No One Behind*

NITI Aayog’s SDG India Index and Dashboard 2020-21 delineates Indian States’ and Union Territories’ performance and progress under 16 Goals. The Index scores them between 0-100. Overall, the country’s SDG score improved by 6 points—from 60 in 2019 to 66 in 2020-21, driven by Goal 6 (Clean Water and Sanitation) and Goal 7 (Affordable and Clean Energy) corresponding to 83 and 92 respectively. This is represented in Figure 3 below:

Mizoram, Haryana, and Uttarakhand are the top gainers in 2020-21 in terms of improvement in score from 2019, with an increase of 12, 10, and 8 points, respectively.

Figure 3: Goal-wise India results, SDG India Index 2019-20 and 2020-21





OVERALL	Aspirant (0-49)	Nil
	Performer (50-64)	Manipur, Madhya Pradesh, West Bengal, Chhattisgarh, Nagaland, Odisha, Arunachal Pradesh, Meghalaya, Rajasthan, Uttar Pradesh, Assam, Jharkhand, Bihar
	Front Runner (65-99)	Dadra and Nagar Haveli and Daman and Diu Kerala, Himachal Pradesh, Tamil Nadu, Andhra Pradesh, Goa, Karnataka, Uttarakhand, Sikkim, Maharashtra, Gujarat, Telangana, Mizoram, Punjab, Haryana, Tripura
	Achiever (100)	Chandigarh, Delhi, Lakshadweep, Puducherry, Andaman and Nicobar Islands, Jammu and Kashmir, Ladakh
		Nil

Source: Press Information Bureau (PIB), 2021 Figure 4: Goal-wise Top States/UTs, SDG India Index 2019-20 and 2020-21



Source: PIB, 2021

India's progress towards SDG 3: Good Health and Wellbeing from 2019 to 2020 presents a promising picture and provides a basis to further India's efforts towards enhancing eye care systems, being the primary goal connecting investment in eye care with the attainment of SDGs. A sustained focus on eye health in policymaking will certainly contribute its bit towards SDG 3 and other goals.

India's results for SDG 2: Zero Hunger are concerning, with its attainment being the farthest among all 17 goals. A focus on improving eye health is imperative, for providing more and wider employment opportunities, increasing household income, and reducing hunger and deprivation.

India's performance towards SDG 1: No Poverty, SDG 4: Quality Education, and SDG 8: Decent Work and Economic Growth, among others, demands further improvement as well. As highlighted in this article, investment in eye care is intricately connected to the attainment of these goals and must be prioritized in light of these results.

## Conclusions

With the above description, it is evident that urgent policy intervention is needed for creating integrated people-centered eye care, embedded in health systems and based on strong primary health care, and scaled and decentralized to the grassroots level in the country. Emphasis on eye care in local governance -especially at the district level - is of paramount importance for effective implementation.

We recommend periodic cataract surgery programs and public eye health initiatives- even basic awareness programs for different age and gender cohorts. It is important that public health experts and community ophthalmology practitioners must consider targeting women and the elderly in efforts to curb blindness and evaluate local barriers to availing services. Further, the socio-economic barriers that prevent women from seeking eye care must be comprehensively explored and appropriately acted upon.

A key strategy to augment eye health that advances the attainment of the SDGs is to invest in human resource development, in particular the development of midlevel ophthalmic personnel, and training for the integration of primary eye care into primary health care.

We make a clarion call for the accessibility, availability, and affordability of quality eye care services across all geographical and socio-economic parameters. For this, it is important to ensure appropriate and timely investment in eye care and awareness among the masses in terms of prevention, treatment, and rehabilitation. Further, these suggestions build upon the objectives and new focus areas of the Ministry of Health and Family Welfare's National Programme for Control of Blindness and Visual Impairment.

To conclude, if this decade is truly to be the Decade of Action for the SDGs, eye health services must be fully mainstreamed into universal health coverage, and community-based eye health services led by well-trained multi-disciplinary teams (Webson, 2021). The findings of this study suggest and reiterate that a renewed approach toward the 2030 Agenda requires a focus on eye care, which will also enhance the well-being and capabilities of the population. Towards this, political

will and effective participation of all relevant stakeholders are needed, which will tackle current needs, and assess and address future demands of the population.

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