

## **CBM AND THE 2030 AGENDA FOR SUSTAINABLE DEVELOPMENT:**

### **Strengthening Environmental Sustainability and Inclusion in Health and other Development Programs**

**Practical guidance for Environmental  
Sustainability, Accessibility, Gender, Safe-  
guarding and Disaster Risk Reduction**





CBM is an international Christian development organisation, committed to improving the quality of life of persons with disabilities, and those at risk of disability, in the world's poorest communities. CBM seeks an inclusive world in which all persons with disabilities enjoy their human rights and achieve their full potential.

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This case study booklet can be found at: [http://www.cbm.org/article/downloads/54741/Improving\\_Environmental\\_Sustainability\\_and\\_Accessibility\\_in\\_Eye\\_Health.pdf](http://www.cbm.org/article/downloads/54741/Improving_Environmental_Sustainability_and_Accessibility_in_Eye_Health.pdf)

Feedback and ideas related to these case studies and additional checklists are very welcome, please email CBM's Technical Unit via [contact@cbm.org](mailto:contact@cbm.org)

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## The Purpose of this Booklet

The purpose of this booklet is to promote discussion and innovation for strengthening **environmental sustainability** and **inclusion** in health and other development activities. The case studies and checklists are designed to foster creative thinking and the ongoing gathering of evidence related to these topics. The booklet will be useful to anyone seeking high quality outcomes from health and other development programs.

The information was first compiled for CBM's engagement in the General Assembly of the International Agency for the Prevention of Blindness 2016, however will be useful for advancing sustainable development with inclusion in any context.

The authors greatly appreciate feedback, ideas and opportunities for ongoing discussion. Contact information can be found inside the front cover of the booklet.

Readers are welcome to use the material on a not-for-profit basis, with reference made to CBM.

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**Front cover photos** - Top and bottom left: Caritas Takeo Eye Hospital, Cambodia ©CTEH.

Bottom right: photo taken at outreach clinic of UMC Lowell and Ruth Gess Kissy Eye Hospital, Sierra Leone ©CBM.



Caption 1: Trees and accessible green spaces create a pleasant environment, which is welcoming to all people. ©CTEH



Caption 2: High quality inclusive practice for all people, ensures facilities are welcoming to people with disability and to those facing marginalisation for any other reason. ©CTEH/CBM

## Case study 1: Environmental Sustainability in Eye Health, Caritas Takeo Eye Hospital (CTEH), Cambodia

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### Case study prepared by:

CBM's Environmental Sustainability Working Group (Mr David Lewis as Focal Point), Dr Manfred Moerchen (CBM Co-worker Ophthalmologist & Regional Advisor for Inclusive Eye Health), Mr Te Serey Bonn (Programme Director, Caritas Takeo Eye Hospital, Cambodia) and Ms Julie Webb (Australian based environmental specialist).

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## Introduction

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Climate change is predicted to be one of the largest global health threats of the 21st century. Health care itself is a large contributor to carbon emissions. As an example the carbon footprint of the National Health Service (NHS) in England is estimated at 20 million tonnes of greenhouse gases (GHGs) per annum, accounting for 25% of all public sector emissions in the United Kingdom.<sup>1</sup> We note that the NHS has put in place a Sustainable Development Management Plan, seeking to improve economic, social and environmental sustainability. The authors see it as essential that health services in all countries play their part in reducing carbon emissions and improving their overall environmental sustainability, as part of 'sustainable development'.<sup>2</sup>



Figure 1: Visual Acuities are conducted in an open room with natural air-flow, rather than in a room with air-conditioning, consuming significant energy. ©CTEH

## CBM and Environmental Sustainability<sup>3</sup>

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CBM understands that environmental degradation, climate change, food shortages and competition for scarce resources are inextricably linked with poverty and disability. All these factors play a part in the prevalence of preventable impairments and have an impact on the poverty, quality of life and health outcomes for people with disability, their families and their communities.<sup>4</sup>

**In line with its vision, mission and values, 'Agenda 2030 for Sustainable Development'<sup>5</sup>, and the global environment in which CBM is operating, CBM is committed to:**

Participating in global efforts aimed at protecting and improving the environment, and reducing climate change<sup>6</sup>, including through the lowering of carbon emissions.

Ensuring that people with disability participate in and benefit from poverty-reducing environmental strategies as their human right, and as an integral component of Disability Inclusive Development.<sup>7</sup>

## Actions

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### **Avoiding potential negative impacts on the environment**

1. Assess, avoid and mitigate potential negative impacts on the environment e.g. ensuring correct handling of medical waste and sewage; appropriate choices of construction materials; responsible use of ground-water.

### **Enhance 'environment sustainability'**

2. Pursue actions for strengthened environmental sustainability, and which will positively impact on climate change, including reduction of, or compensation for our CO2 emissions, e.g. moving to renewable energy sources; improving the efficiency and use of buildings, transport and travel; practising sustainable water management; adopting sustainable and ethical purchasing; practising the 5 R's: refuse, reduce, re-use, re-purpose, recycle; creating accessible green spaces and planting trees at CBM associated facilities.

### **Opportunities for people with disability, within the framework of Disability Inclusive Development**

3. Seek out opportunities which will see people with disability and their families, participate in, and benefit from mainstream environmental activities, e.g. community development and livelihood activities available through 'Climate Change Adaptation and Resilience' programs; people with disability empowered to join advocacy for their local environments - such as protecting community land, forests and water supplies from destruction, degradation and pollution. These are actions critical to the health and quality of life of whole communities.

This case study particularly looks at proposed actions 1 and 2 above. CBM is also keen to play its part in achieving the Sustainable Development Goals (SDGs) of Agenda 2030.<sup>9</sup> Particularly relevant to this case study are Goals 9, 12, 13 as follows:

- ▲ Goal 9 Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation
- ▲ Goal 12 Ensure sustainable consumption and production patterns
- ▲ Goal 13 Take urgent action to combat climate change and its impacts

Relevant to the SDGs, CBM notes that bi-lateral climate-related 'Official Development Assistance' (ODA) funds are steadily increasing as a proportion of total ODA. This trend is likely to reduce available donor funds in some areas, while increasing funding opportunities related to climate and environment.

## CBM's 'Green Office' initiative

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Standards and guidelines were established by the CBM 'Green Office' initiative in 2012, broadly based on the helpful work of World Wildlife Fund. These guidelines cover buildings (energy and water), materials (consumables, equipment), travel (land and air) and other activities.

When established well, 'Green Office' initiatives improve environmental sustainability and can also create considerable cost savings, especially in the longer term.

To reduce the environmental footprint, risks and hazards of a facility, together with enhancing the environment, it is possible to take action in:

- ▲ Design and layout
- ▲ Equipment, energy and water choices
- ▲ Use, management, maintenance and messaging for the facility.

Taking action in all of these stages will improve environmental sustainability, and also give improved efficiency and cost savings. The sum of many actions will create the largest impact. All these stages are considered in the checklists accompanying this case study, beginning at Page 20.

## Caritas Takeo Eye Hospital, Cambodia

### Background

Cambodia is one of the poorest countries in the Asian region. It is ranked 143 out of 188 countries in the 2015 United Nations Human Development Report. The prevalence of blindness in Cambodia is estimated to be 3.3% in people aged 50 years and older, with cataract identified as the main cause. Over 80% of the population lives in poorer rural areas, and blindness is a significant factor contributing to poverty.<sup>10</sup>

Caritas Takeo Eye Hospital (CTEH), 80km southwest of the capital Phnom Penh, was developed in partnership with CBM. It serves the population of the central and southern regions of Cambodia, including Takeo Province. Within this population there are at least 30,000 people who are blind.<sup>11</sup>

CBM's close partnership with CTEH from 1996 to 2013 included secondment of expatriate ophthalmologists and other personnel for technical support and capacity development. The strength of this partnership has resulted in a high quality, sustainable eye health service, which serves as a key teaching hospital under the umbrella of the Ministry of Health.

CTEH continues to be one of the facilities performing the highest number of cataract surgeries in Cambodia, with approximately 2,000 surgeries per year. It also ensures treatment for glaucoma, trachoma, corneal ulcers, diabetic retinopathy, diseases causing childhood blindness and other conditions. CTEH also provides training, rural outreach, low vision services and has close cooperation with community based inclusive development programs.



Figure 2: As well as seeking environmental sustainability, CTEH seeks to implement high quality disability inclusive practice. ©CTEH/CBM

## Caritas Takeo Eye Hospital's New Buildings

CTEH was formerly housed in a 60 year old building previously used as a military hospital during the war. By the mid 2000s the hospital was severely termite-ridden. The administration block roof collapsed, tiles fell off walls in operating theatres and subsidence caused walls to shift and crack. There were major issues of safety and sterility.

A technical assessment in 2006 found it would be more cost effective and efficient to construct a new building, than trying to renovate. Plans were made for construction of a modern eye care centre aimed at delivering increased service rates, together with improved training, treatment and research facilities. In this process, the Programme Director Mr Te Serey Bonn, the Programme Advisor Sister Myrna Porto DC and CBM Ophthalmologist Co-worker Dr Manfred Moerchen worked closely with the hospital management team, architects and builders to ensure high regard for environmental sustainability was embedded in construction and into plans for ongoing management and maintenance.

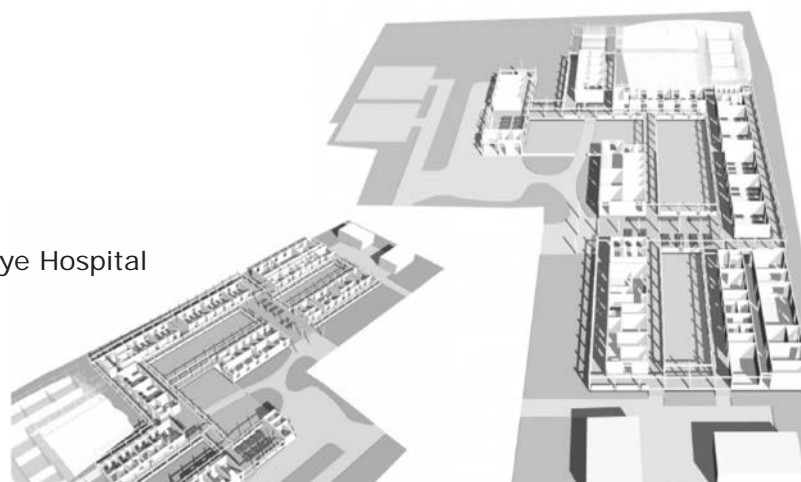
Therefore rather than building a facility which would rely heavily on energy and cost-intensive air conditioning, the team determined to construct a facility which was energy and water efficient, while being comfortable and welcoming for staff and patients. They also decided to apply Universal Design<sup>12</sup> principles, which improve accessibility and utility for all members of a population including people with disability, older people, nursing mothers and young children.

The design team was fortunate that once the old hospital was demolished, quite a large area was available for the new construction.



Figure 3: Open, airy verandahs allow for air movement, keeping the hospital cooler, and creating a pleasant environment for patients to wait. ©CTEH

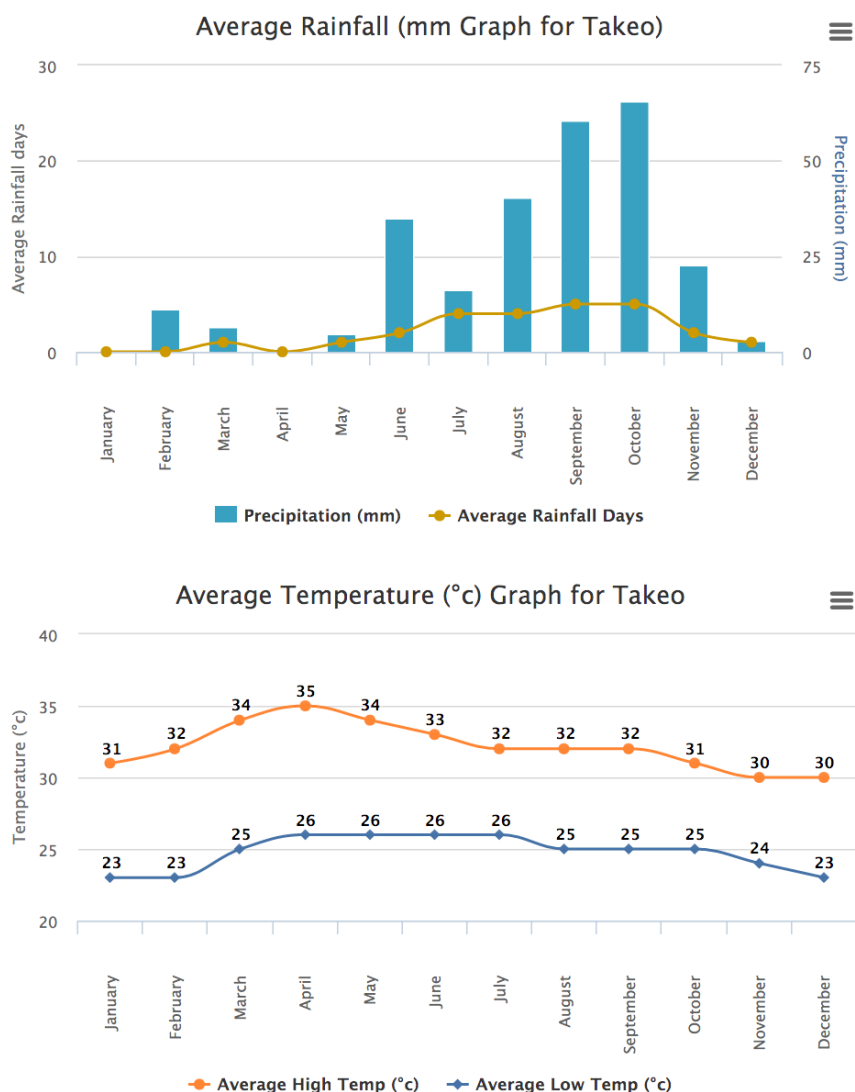
Architectural design Takeo Eye Hospital



## The climate

The indoor climate of hospital buildings in any region, has an impact on the well-being of patients and staff. Discomfort can be especially accentuated in hot and humid conditions. Additionally these conditions generally result in increased maintenance requirements and reduced life-span of equipment such as microscopes and ophthalmic lasers. Ensuring a good design poses several challenges. It is essential to consider current climatic conditions and their impact, while also considering how climate change will affect future conditions. High temperature and humidity levels make it difficult to achieve lower temperature targets inside rooms, while also ensuring minimum energy use. Therefore, high regard should be paid to passive design strategies, such as natural ventilation.

Cambodia's climate is dominated by monsoons, with a rainy season from May to October and a dry season from November to April. The warmest month is April when maximum temperatures may rise to 38°C. Humidity is high throughout the year, even in the dry season, and can be as high as 90% during the night.



Weather data accessed at

<http://www.worldweatheronline.com/takeo-weather-averages/takeo/kh.aspx>

## Actions taken at each stage by Caritas Takeo Eye Hospital

While maintaining focus on the core purpose of the facility, the design team took important actions to reduce the environmental footprint, risks and hazards associated with the hospital, as well as taking actions to enhance the environment.

### Design and layout

The design prioritised minimal demand for air conditioning, so that the environmental and financial costs of managing the hospital would be greatly reduced over its lifetime:

- ▲ The design encourages continuous airflow through cross ventilation and includes shaded windows.
- ▲ The outpatient waiting area is large and open, and allows users to relax in the fresh air, and with good accessibility.
- ▲ If a room required air conditioning, such as those housing heat sensitive equipment or consumables, it was made as small as possible with good door seals and thick doors.
- ▲ The building was built to withstand anticipated floods and storms through a raised floor. As much as possible durable and sturdy materials for chairs and benches were used (e.g. terrazzo instead of plastic or wood).



Figure 4: The outpatients waiting area remains cool and pleasant, thanks to natural ventilation and shaded windows. ©CTEH



## Equipment, energy and water choices

Choices were made in the selection and installation of equipment to reduce consumption of energy:

- ▲ Lighting systems have either a sensor so they are only turned on when needed or have a timer so that they are only on during normal working hours.
- ▲ There are single lamp tubes in each light fitting, rather than the usual double lamp installation. The light from the single lamps is considered more than adequate.
- ▲ Computers and monitors have power saving settings and surge protection power boards.

The hospital has a 3.5 Kilowatt solar panel system provided by a donor to CBM. The battery pack is cooled by a single fan, to extend its lifespan. The solar panel system provides back-up and security lighting. If the hospital is able to access further grants, the size of the solar panel system will be increased.



Figure 5: Car park with solar panel system on the roof. Single tube low energy fluorescent lights are used. For important equipment, the power supply is assured and also protected with an Uninterruptible Power Supply (UPS) unit.  
©CTEH/CBM



## Water

Personnel are encouraged to practise water efficient behaviours, with messages promoted during staff meetings and through good signage.

The facility also improves the supply and efficiency of water by:

- ▲ Installing under-ground and above-ground water tanks for storage of harvested rainwater. The 100,000 litre capacity is enough for several days of peak use.
- ▲ Installing bucket flush toilets for all but two toilets, as a specific way to encourage more efficient water use.



Figure 6: Some of the rain water collection tanks on site. Further storage is under ground, making a total of more than 100,000 litres. Inexpensive shading is provided for motor cycles.  
©CTEH/CBM

### Use, management, maintenance and messaging for the facility

Important day to day actions reduce the facility's environmental footprint still further.

#### Energy

- ▲ Personnel are encouraged in good energy efficient behaviours, which are promoted in staff meetings and through good signage.
- ▲ Where air conditioners are needed, such as in the operating theatres, they are set at no less than 23 degrees Celsius. The only exceptions for cooler temperatures are for storage of medicines or rooms with specialist equipment, such as the ophthalmic lasers.



Figure 7: Staff meeting in open air restaurant area ©CTEH/CBM



- ▲ Over 90% of cataract surgeries are performed using the Small Incision Cataract Surgery (SICS) technique, which produces less waste and consumes less energy than phaco-emulsification.<sup>13</sup>
- ▲ Additionally: Consultation with a regional NGO GERES resulted in the purchase of energy-efficient cook-stoves (also called Lao stoves) for the hospital kitchen. Compared to traditional cook-stoves, 20-30% of wood or charcoal is saved.<sup>14</sup>



Figure 8: Accompanying persons of patients who have been admitted to the hospital, cook meals using “Lao stoves”. ©CTEH



### Medical Waste, Effluent, Storm-water

- ▲ An onsite incinerator in a locked compound is used to dispose of medical and other hazardous waste. The incinerator meets WHO and Ministry of Health guidelines.
- ▲ As noted in the ‘energy’ section, the hospital’s high level use of Small Incision Cataract Surgery (SICS) produces less waste than phaco-emulsification.
- ▲ The hospital effluent is managed in a properly designed sewage system, located in a fenced compound.
- ▲ The installation of a reed bed allows overflow from the sewage system and storm-water to be well managed, ensuring polluted water does not enter local water-ways or villages. Fish have been added to the reed-bed to eat mosquito larvae and other insects.



Figure 9: An incinerator in a locked compound ensures safe disposal of hospital waste, with minimal environmental risks and hazards to the local population. ©CTEH/CBM



Figure 10: In order to protect local waterways and villages from hospital sewage and run-off water, a well designed sewage system has been constructed. This includes establishment of reed-bed pond. Fish have been added to eat mosquito larvae and other insects. Hospital staff use the area alongside the reed-bed to grow vegetables. ©CTEH/CBM

### Reduce, Re-use, Recycle

- ▲ The layout of key printed forms was changed, including paper size and ensuring printing on both sides to reduce paper use.
- ▲ Recycled paper is used for patient cards.
- ▲ Heavy grade paper is used only when required.
- ▲ Printers have refillable ink cartridges.
- ▲ Recycling bins were introduced, however better instructions, and use of different coloured bins is suggested to improve patient understanding.

## Travel and transport

- ▲ Cycling is encouraged with provision of secure and shaded parking for bicycles, as well as motor bikes and vehicles.
- ▲ Motor cycles are used for errands.
- ▲ In recent years, more fuel efficient vehicles have been chosen, with a move to LPG gas, and their use closely regulated.

## Planting of trees and flowers to enhance the environment

- ▲ Plantings create a cool, shady, pleasant and beautiful environment, which is also accessible for people with disability.
- ▲ The trees include teak and mango. Mango fruit are rich in Vitamin A, so play an important role in patient education for the prevention of eye diseases related to Vitamin A deficiency.
- ▲ Trees protect the soil from the heat of the sun, keeping it cooler, preserving moisture and creating more balanced environmental conditions.
- ▲ Trees provide protection from the wind.
- ▲ A more humid environment reduces the amount of watering needed for plants in the dry season.



Figure 11: Trees and gardens surrounding the hospital create a cooler, more pleasant environment, and also provide fruit and timber.  
©CTEH

## Monitoring and managing progress

- ▲ An NGO in Phnom Penh helped the hospital to monitor its carbon and other environmental footprint. This allowed management to make informed decisions about future equipment purchases and to identify opportunities for increased efficiency.

## Staff and community engagement

- ▲ The management team at CTEH is aware that an informed, empowered and engaged staff will give far more ownership of actions aimed at environmental sustainability, than a top-down imposed approach.
- ▲ Furthermore the local community sees the hospital as a positive and green addition to their environment.
- ▲ CTEH has designated staff members who encourage actions for reduction of environmental footprint, risks and hazards, as well as actions to enhance the environment
- ▲ Encouragement during staff meetings, good signage and celebrating milestones (e.g. installation of the solar power system) enhances good practices and behaviours, and creates ownership.

Please see checklists on Page 20.

## Sustainable Procurement

- ▲ As well as seeking value for money in procurement, CTEH seeks to implement 'sustainable procurement' practices for consumables, pharmaceuticals and equipment. In practice this especially means seeking to source goods in Cambodia or in the region, rather than from e.g. Europe. As well as reducing the costs and carbon footprint of freight, this practice brings benefit to local economies.
- ▲ Furthermore, when equipment is purchased locally there are generally trained local technicians available for maintenance.

## Case Study 2: Strengthening Accessibility and Inclusion in Eye Health. UMC Kissy Eye Hospital, Freetown, Sierra Leone, West Africa

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### Case study prepared by:

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### UMC Lowell & Ruth Gess, Kissy Eye Hospital

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In 2014-15 the UMC Lowell & Ruth Gess, Kissy Eye Hospital in Freetown, Sierra Leone, made significant strides to becoming more accessible, friendly and welcoming for people with disability and the whole community. The hospital is located in Kissy, one of the poorest parts of Freetown, surrounded by low income settlements. It had been renovated and a new theatre and out-patient department had been built over 10 years ago, thanks to a generous donation to CBM Australia. The new buildings are known as the JEM Clinic in memory of a close family member of the donor. Construction occurred shortly after the devastating civil war in Sierra Leone had ended.

As some repairs were due, the team of the Kissy Eye Hospital grasped the opportunity to improve the physical accessibility, especially for people with vision impairment. The CBM guideline “Inclusion made easy in eye health programs – disability inclusive practices for strengthening comprehensive eye care”<sup>15</sup> was a useful tool for the identification of access barriers. It became for instance apparent that there was a lack of Universal Design principles (see Endnote 12) in the most frequently used rooms of the out-patient department. Signs to navigate and locate around the building were difficult to read even for people without vision impairment. Doors and door-handles were difficult to identify due to lack of contrast to the surrounding walls etc. (Pictures 1 and 2).

It was decided to identify urgent and especially low-budget access needs that the hospital was able to respond to first. Simple repainting of the walls and doors with high contrast colors enhanced identification of doors. Locally hand-made, affordable signs were designed to identify the most important information needed, e.g. location of examination rooms, pharmacy, optical shop etc. The size of lettering needed was easily calculated using CBM's manual ‘Promoting Access to the Built Environment Guidelines’.<sup>16</sup> The result demonstrates that considering Universal Design principles could lead to a win-win situation for all people, not only those with vision impairment.

It also shows that striving for disability inclusive eye health is possible with a low budget (Pictures 3 and 4 below).

**For projects that strive to improve accessibility for people with disability, it is important to find strategies that are feasible and work in the local context.**

Further plans to strengthen disability inclusive practices beyond physical accessibility are already planned, with inclusion training and implementation of a low vision department at Kissy Eye Hospital.

We are also delighted that Kissy Eye Hospital continued to operate through the period of extreme hardship caused by Ebola in Sierra Leone and the wider West African region. They now ensure that Ebola survivors receive needed treatment for resulting eye conditions, and also create links with community mental health programs and other services.



Picture 1: main waiting area of Kissy Eye Hospital before renovation (see the improvements in photo 3). ©CBM/Moerchen



Picture 2: note the area in front of the cashier overloaded with difficult to read signs and posters before renovation (see the improvements in Picture 4). ©CBM/Moerchen



Picture 3: main waiting area of Kissy Eye Hospital after renovation. ©CBM/Moerchen



Picture 4: cashier area at Kissy Eye Hospital, after renovation. ©CBM/Moerchen

## Inclusion in Eye Health – ten tips for getting started

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### Introduction

To make headway in achieving 'Agenda 2030 for Sustainable Development' and its 'Global Goals' relating to eye health, it is important that all agencies work together in strengthening our inclusive practices. We can learn together by sharing our approaches and the evidence we gather.

For CBM, Inclusive Eye Health is essential if we are to reach the poorest and most marginalised people. 'Leaving no-one behind'.

The Global Goals (Sustainable Development Goals) we have identified as having particular relevance to Inclusive Eye Health are:

- ▲ Goal 1. End poverty in all its forms everywhere
- ▲ Goal 3. Ensure healthy lives and promote well-being for all at all ages
- ▲ Goal 5. Achieve gender equality and empower all women and girls
- ▲ Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

(See Endnote 5)

### Our ten tips aimed at promoting discussion and innovation

#### 1. The objective

Ensure people with disability, including those with vision impairment, and all marginalised people gain their right to participate in and benefit from quality eye health services on an equal basis with others; and that people with permanent vision impairment access their right to wider opportunities in health, rehabilitation, education, livelihoods, social inclusion and empowerment. 'Leaving no-one behind'.

#### 2. Awareness

One in five people living in poverty has a disability. Increase knowledge about the rights and capacity of people with disability, dispelling possible myths about causes of impairment. Create awareness of the need for broad inclusive practice in your facility, considering all factors creating marginalisation, e.g. disability, gender, age, ethnicity, religious group, poverty, access to education and geographic isolation, and the intersection of these factors

#### 3. Participation

Actively engage with people with disability and Disabled Peoples Organisations (DPOs) to strengthen your eye health program. Employ people with disability and include them in the governance of your program.

#### 4. Disability inclusion officer/disability advisory committee

As part of existing staff roles or in a dedicated position, appoint individuals to be responsible for leading disability inclusion and broader inclusion in your eye health program.

#### 5. Disability inclusion policy/budget

Develop a policy and guidelines for inclusion, linked with other relevant policies in gender and child safeguarding. Aim to foster the creation of safe, welcoming, accessible and inclusive facilities for all people. Ensure your approaches cover linked activities such as outreach.

Create a budget line for strengthening inclusive practices.

#### 6. Physical access

Work with people with disability to identify and address all physical access barriers in and between buildings, including toilet facilities. Ensure large and contrasting signage.

#### 7. Communication

Develop written and spoken communication which is accessible to all, especially people with vision, hearing or intellectual impairment and those who are unable to read.

#### 8. Financial barriers

Address cost barriers to treatment, transport and accommodation for people with disability and other poor people. Where relevant, include accompanying persons. Don't assume that 'universal health coverage' is covering all patients.

#### 9. Referral and support networks

Develop and broaden your networks to strengthen inclusion, building networks with mainstream and disability-specific services such as Primary Health Care, Education, Community Based Rehabilitation (CBR), livelihood and social inclusion programmes, both government and non-government.

#### 10. Blindness and low-vision services

Ensure the 20% of people with permanent vision loss, whose sight cannot be restored, are supported with their families to receive counselling, and access wider opportunities with low-vision services, inclusive education, Community Based Rehabilitation (CBR), Disabled Peoples Organisations (DPOs), mainstream livelihood programmes, social inclusion, social welfare, empowerment and also wider health care.

## Checklist 1: Strengthening Environmental Sustainability

A checklist for facility design, choice of equipment, use, management, maintenance and messaging. (With thanks and acknowledgment to World Wildlife Fund for their 'Green Office Initiative to Reduce Ecological Footprint', which assisted in development of the checklist. <https://wwf.fi/en/green-office/>)

This list is not exhaustive. The authors would appreciate feedback and hearing of other environmental ideas and innovations.

Please email: David Lewis and Dr Manfred Moerchen via CBM's Technical Unit, [contact@cbm.org](mailto:contact@cbm.org).

### A: Energy

#### Design

##### **Avoid the heat (especially applicable in tropical climates)**

- ▲ Orient the design to reduce midday sun exposure
- ▲ Plant vegetation for shading and creating a cool, pleasant environment, without blocking breezes. A green and pleasant environment improves mental health. Make green spaces accessible for people with disability.
- ▲ Use insulation – ceilings, doors, walls, and modified glazing
- ▲ Use light-weight, insulated building materials where appropriate

##### **Maximize natural ventilation and light**

- ▲ Install windows facing cooling breezes
- ▲ Build above the ground for airflow
- ▲ Locate working areas near windows for natural light

##### **Additional cooling**

- ▲ In areas requiring air conditioning, build rooms as small as possible
- ▲ Use evaporative cooling units if climate allows
- ▲ If space allows include verandahs or deep balconies
- ▲ Include plants for cooling effect and to channel cool breezes, as well as providing shade
- ▲ Ensure projected climate risks such as storms and floods are built into planning, e.g. appropriate floor clearance from ground, reinforced construction, high capacity storm water drainage.

#### Choosing equipment

##### **Energy supply**

- ▲ Use renewable energy such as solar with well maintained battery storage. (This also provides back-up power).

- ▲ If including a back-up generator, ensure maximum energy efficiency, good maintenance and placement to minimize air and noise pollution.
- ▲ Install solar hot water with adequate storage

### **Other equipment**

- ▲ Select computers and other equipment which are energy efficient
- ▲ Install good insulation if not included in construction
- ▲ Install air conditioners with specific controls for each site, which are as efficient as possible
- ▲ Install flexible lighting systems – timers, sensors and appropriate lighting levels. Use natural light where possible
- ▲ Select low energy light bulbs/tubes

### **Using and maintaining the facility**

- ▲ In hot season, set thermostats at warmest level which is comfortable and appropriate for that location. In cool season set at coolest level which is comfortable. (Optimal comfort range for office work is 21-25°C)
- ▲ Run ongoing staff awareness campaigns which include signage for “good switch off” behaviours and closing doors to cooled rooms
- ▲ Change computer settings to energy efficient settings
- ▲ Install timers, sensors and energy saving switches
- ▲ Include indoor plants for air quality and a pleasant environment
- ▲ Encourage seasonally appropriate dress
- ▲ Practise de-lamping where light is adequate (e.g. reducing from double to single tubes)
- ▲ Prioritize Small Incision Cataract Surgery (SICS) over phaco-emulsification, due to reduced production of waste and lower energy use<sup>17</sup>

### **B: Water**

- ▲ Harvest and store rainwater
- ▲ Build underground rainwater storage if space is limited
- ▲ Install low water use equipment eg toilets, showerheads
- ▲ Manage storm water flow from the site with regard to natural topography, planting vegetation and using porous materials such as gravel (e.g. on driveways and surrounds)
- ▲ If possible store storm water for watering gardens
- ▲ Provide water dispensers with clean drinking water for patients and staff. (This will reduce plastic bottle waste and expense)
- ▲ Run an ongoing staff awareness campaigns to reduce water use, including with signage

### **C: Procurement practices and reducing waste**

- ▲ Seek to implement 'sustainable procurement' practices such as local purchase for consumables, pharmaceuticals and equipment. As well as value for money, these practices take account of environmental and ethical considerations in procurement.
- ▲ Where possible seek recycled building materials or sustainable products – especially when using timber
- ▲ Consider the embodied energy of the materials used<sup>18</sup>
- ▲ Avoid high toxicity paints and other building materials. Take care for materials such as asbestos in demolition
- ▲ Minimize waste in construction through sorting waste onsite and seeking alternatives (e.g. donating/recycling waste products)
- ▲ Select printers which can print double sided
- ▲ Make black and white, double sided printing standard practice/default
- ▲ Install separated waste systems for re-use and recycling where possible
- ▲ Buy recycled and certified sustainable paper and other environmentally responsible products
- ▲ Set up paper re-use system for single sided paper, and recycling or re-use of print cartridges
- ▲ Reduce cooking fire-wood or charcoal by using improved cooking stoves and spaces
- ▲ If locally available, install bio-digester to generate methane gas for cooking/ water heating
- ▲ Ensure proper disposal of medical and other hazardous waste (e.g. approved incinerator)
- ▲ Run ongoing staff awareness campaigns which include signage for: reduce / re-use / recycle

### **D: Local environment**

- ▲ Seek to construct in locations with the least sensitive plants and animals
- ▲ Minimise loss of vegetation, damage to local water-ways and the landscape in construction
- ▲ Avoid night time noise and light pollution
- ▲ If area allows, create pleasant and welcoming green spaces which are accessible for people with disability
- ▲ Seek to use local plants and create spaces for biodiversity to recover
- ▲ Encourage staff and facility user groups to manage and monitor local environmental conditions such as water quality, plant, animal or bird life

## **E: Transport and travel**

- ▲ Select fuel efficient fleet vehicles
- ▲ Plan for efficient use of air travel and other long distance travel through clustering meetings, delegating attendance or locating meetings en route to other activities
- ▲ Use telephones, teleconferencing or video conferencing whenever possible
- ▲ Encourage public transport and shared travel by staff
- ▲ Provide facilities on site which encourage efficient travel practices such as secure parking and showers

## **F: Management**

- ▲ Carry out ongoing monitoring of design, construction and facility management for environmental sustainability
- ▲ Set up a data collection system for monitoring energy, water and other consumables. (Seek to establish baseline data to measure progress)
- ▲ Set up consultation and collaboration with organizations who are experts in environmental protection and environmental friendly practices
- ▲ Set up maintenance schedules which ensure systems are functioning well

## **G: Staff and community engagement**

- ▲ Consult with staff and community, including people with disability and ensuring gender balance, for actions aimed at strengthening environmental sustainability
- ▲ Create an informed, empowered and engaged staff, who will have ownership of actions
- ▲ Appoint a team to lead, monitor and give encouragement about progress
- ▲ Include a member of the community on the environmental team, especially if the facility is in an environmentally sensitive area.
- ▲ Calculate financial savings achieved through good practice to encourage staff, management boards and external stake-holders
- ▲ Seek funds for environmental innovation from donors who are keen on 'green' approaches, e.g. environmental organisations, local embassies etc.
- ▲ Implement a 'suggestions box', where staff, patients and community can share their ideas on how to improve environmental sustainability
- ▲ Celebrate milestones such as increased electricity coming from renewable sources

## Checklist 2: Further checklists aimed at creating inclusive, accessible, safe, gender-sensitive and welcoming facilities

These checklists were prepared during a workshop of CBM's Global Technical Advisors, and are not exhaustive. Feedback, ideas and innovations are very welcome. Names of the CBM personnel responsible for each of the key areas can be found in the contact information at the front of this document.

**Please email:** CBM's Technical Unit, via [contact@cbm.org](mailto:contact@cbm.org)

### Accessibility

- ▲ Key accessibility principle: Creating continuity in the travel chain
- ▲ Ensure that women and men, boys and girls with disability and people from all marginalised groups participate in and benefit from actions taken to strengthen accessibility
- ▲ Gather reliable data on ground elevation and risks as this will determine orientation of buildings, location, size of ramps and pathways etc
- ▲ Ensure good connection to local transportation: Is the hospital located along a bus transit route? Is there ample parking? Will the state of roads change through the year e.g. become difficult during rainy season?
- ▲ Make sure the design is based on accessibility standards E.g. for physical accessibility: ramps, rails, tactile guides, marked steps, pull straps for doors. Ramps should have a gradient of preferably 1:20, and never steeper than 1:12
- ▲ Consult with staff, patients and local community, including people with disability, to strengthen initial design or renovations
- ▲ Ensure safe, accessible and easy to use paths for connecting building entrances with other facilities, including parking areas, playgrounds, green spaces, service areas etc.
- ▲ Make sure entrance and emergency exits are fully accessible for all users: How would one get in and out of the building? How easy is emergency evacuation?
- ▲ Options for enhancement of entrance accessibility include: automatic door(s), information desk/ reception located near the entrance, large contrasting signage at approximately 1.5m from floor, Braille signage
- ▲ Install large and contrasting signage throughout all public areas, relevant to the flow, orientation and access to the building, including emergency exits. Ensure continuity of information, i.e. signs which take people to their destination
- ▲ Test feasibility of lifts versus ramps for higher floors, also considering safe evacuation
- ▲ Ensure toilets/ bathrooms are accessible for women, girls, men and boys with disabilities, particularly those using a wheelchair (installing grab rails, door pull straps, having enough space to manoeuvre etc.)

- ▲ Provide accessible spaces for children to play with their parents (playground or other spaces)
- ▲ Provide accessible shade, green spaces and resting spaces for people to relax, wait or play. These spaces are important for creating a healthy, comfortable and welcoming environment.
- ▲ Equipment and furniture should be safe and appropriate to age and cultural setting of users
- ▲ Furniture should be child and disability friendly, non-toxic, have no sharp corners or glass, have friendly colours
- ▲ Install door handles which are levers (not round handles requiring gripping and twisting)
- ▲ Design for maximum use of natural light. Ensure adequate lighting day and night for mobility and safety
- ▲ Ensure evacuation procedures, which include people with disability, are in place and regular drills are conducted
- ▲ Ensure costs for maintenance of accessibility are included into the budget. Put in place a schedule with monitoring for good maintenance and cleanliness
- ▲ Build awareness about accessibility with staff, patients and other stake-holders, including people with disability into the process

## Gender

- ▲ Ensure that women and men, girls and boys with disability and people from all marginalised groups participate in and benefit from actions to strengthen gender practices
- ▲ Involve the community, including people with disability in the design phase, ensuring consultations are gender balanced
- ▲ Ensure safety for women, children and all users, especially considering the location of toilets and bathrooms
- ▲ Try to provide some bathrooms which are gender neutral, and also safe and accessible. This is needed to cater for care-givers of different gender in an opposite gender ward (e.g. father of a girl child or mother of a boy child)
- ▲ Try to provide accessible adult spaces, sensitive to gender especially in children's wards e.g. a place for adult care givers to relax or socialise with each other
- ▲ Ensure there are sanitary wear disposal bins in bathrooms
- ▲ Ensure a gender/diversity policy is in place covering human resources and the provision of services
- ▲ Aim for gender balance in the governance and management of the facility
- ▲ Aim for gender balance among personnel (a good target is 50 per cent male and female)
- ▲ Ensure links with community outreach programs, which consider the importance of gender. E.g. programs which take proactive steps to reach women, men, girls and boys including those with disability.

- ▲ Ensure protocols for examination and interventions which are gender sensitive, e.g. considering when a female patient needs a female staff member present
- ▲ Provide assistive devices with options for both genders and sensitive to age. E.g. men, women, girls and boys may have different needs for glasses in terms of design and size
- ▲ Use advertisements and literature representing gender and disability
- ▲ Establish user feedback, enabling issues such as sexual harassment, bullying or sexism to be reported without fear
- ▲ Seek to disaggregate data by sex, age and impairment

### **Safe-guarding of children and adults at risk**

- ▲ Ensure that girls and boys, women and men with disability and all groups at risk, participate in and benefit from actions taken to strengthen safe-guarding and protection in the facility and in the community where the program works
- ▲ Consult children, including those with disability and their communities to assess needs
- ▲ Ensure security with perimeter fence, gates, and trained, respectful, helpful guards
- ▲ Seek to have separate wards for women, girls, men and boys
- ▲ Provide a child friendly environment e.g. playgrounds and toys, green spaces, entertainment, accessible toilets, accessible door handles and light switches, colourful and soft fabrics, wall murals
- ▲ Consider the needs of adult care givers in child spaces
- ▲ Ensure proper lighting and signage (easy to understand and read)
- ▲ Be aware of child-labour in construction and supply chain
- ▲ Facility reception should have good visual access to exit and entry
- ▲ Incorporate child-friendly design aspects like low-height utilities e.g. wash-basins and door handles, especially in children's areas
- ▲ Avoid dangerous furniture and make sure floors, especially play area floors are soft. E.g. if children crawl or sit on the floor, clean floor mats are a low-cost option
- ▲ Have safe, secure windows to prevent children being injured, falling out or getting cold
- ▲ Ensure that walkways and paths are smooth, even and avoid obstacles for accessibility and to prevent falls
- ▲ Avoid dark and isolated corners and spaces. Open space is better to ensure safety and supervision E.g. doors with transparent, safety-glass panels
- ▲ Consider CCTV Cameras in public areas
- ▲ Provide a safeguarding/protection policy to protect children and 'adults-at risk'

- ▲ Have regular safeguarding trainings and a 'code of conduct' signed by all staff, volunteers and institution representatives
- ▲ Provide staff with training on general ethics and standards including hygiene to prevent infections
- ▲ Ensure a clean sanitized environment. Prevent cross-infection and new infections
- ▲ Ensure children are accompanied and supervised by responsible adults in waiting and intervention rooms, and wards on 24 hour basis
- ▲ Seek to reduce waiting times for children and more vulnerable adults
- ▲ Assure patients of quality practice and have insurance in place against possible malpractice
- ▲ Provide easy to read visual information about child and adult safeguarding and protection. Clearly publicise avenues to report any code of conduct breaches
- ▲ Display abridged versions of code(s) of conduct in accessible formats

### **Disaster Risk Reduction (DRR)**

- ▲ Ensure that women and men, boys and girls with disability and people from all marginalised groups, participate in and benefit from actions taken for Disaster Risk Reduction
- ▲ Ensure buildings are strong and resistant to environmental hazards
- ▲ Provide sealed doors to prevent flooding
- ▲ Provide safety equipment: fire extinguishers (foam + water hose), grab bags and sufficient food and water rations, smoke detectors, life jackets if needed
- ▲ Provide alarm systems (sound, light, vibration)
- ▲ Provide evacuation chairs and pulleys system to provide safe emergency evacuation for persons with mobility disabilities, in the event that lifts or stairs cannot be used
- ▲ Run regular staff Disaster Risk Reduction trainings and simulations, which include people with disability and other vulnerable people
- ▲ Display accessible evacuation plans and hold regular drills, which include people with disability and other vulnerable people. Security experts recommend quarterly drills
- ▲ Provide awareness and training to patients and family on nutrition and protecting food supplies during emergencies
- ▲ Ensure regular maintenance of buildings, equipment and alarms with regard for possible hazards according to context, e.g. floods, storms, fire, conflict
- ▲ Install secure underground electrical cables
- ▲ Ensure daily record of presence, staff and out/in patients, patients with special needs
- ▲ Store records in fire and water proof cabinets
- ▲ Monitor weather and climate hazards

## Endnotes

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1. Morris, D.S.; Wright, T; Somner, J.E.A.; Connor, A.; '**The carbon footprint of cataract surgery**', *Eye* (2013) 27, 495–501; doi:10.1038/eye.2013.9; published online 22 February 2013 <http://www.nature.com/eye/journal/v27/n4/full/eye20139a.html>
2. A Definition of '**Sustainable Development**'  
  
"Sustainable Development is development which meets the needs of the present, without compromising the ability of future generations to meet their own needs and aspirations."  
*Our Common Future: Report of the World Commission on Environment and Development, 1987, Chapter 2: Towards Sustainable Development, Part 1*, <http://www.un-documents.net/ocf-02.htm>, accessed June 19 2014.
3. In relation to **Environmental Sustainability**, CBM is referring to the 'natural or bio-physical environment' and not the 'built environment', which is referred to in CBM's 'Promoting Access to the Built Environment Guidelines'. [http://www.cbm.org/article/downloads/54741/CBM\\_Accessibility\\_Manual.pdf](http://www.cbm.org/article/downloads/54741/CBM_Accessibility_Manual.pdf)
  - ▲ The 'natural environment' includes all surroundings and conditions in which life on earth exists and functions, including land, soil, water, air, plants, animals and biological processes.
  - ▲ For CBM the 'natural environment' refers to: The environment where people with disability, their families and communities live, meet and work for their livelihoods, where CBM and program partner buildings are located, and the wider global environment.
4. Included in CBM's Global Programme Strategy Context Analysis.
5. **The 17 Global Goals (Sustainable Development Goals)** of 'Transforming our world: the 2030 Agenda for Sustainable Development' <https://sustainabledevelopment.un.org/post2015/transformingourworld>
  1. End poverty in all its forms everywhere
  2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture
  3. Ensure healthy lives and promote well-being for all at all ages
  4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
  5. Achieve gender equality and empower all women and girls
  6. Ensure availability and sustainable management of water and sanitation for all
  7. Ensure access to affordable, reliable, sustainable and modern energy for all
  8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
  10. Reduce inequality within and among countries
  11. Make cities and human settlements inclusive, safe, resilient and sustainable
  12. Ensure sustainable consumption and production patterns
  13. Take urgent action to combat climate change and its impacts\*
  14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development
  15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
  16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
  17. Strengthen the means of implementation and revitalise the global partnership for sustainable development
6. A Definition of '**Climate Change**'  
The Intergovernmental Panel on Climate Change (IPCC) defines climate change as 'any change in climate over time, whether due to natural variability or as a result of human activity'. IPCC (Intergovernmental Panel on Climate Change), 2001, *Third Assessment Report: Impacts, Adaption and Vulnerability*. [http://www.grida.no/publications/other/ipcc\\_tar/](http://www.grida.no/publications/other/ipcc_tar/).
7. **CBM documents on Disability Inclusive Development**. <http://www.cbm.org/Inclusive-Development-246768.php>
8. '**Environmental Footprint**' can be defined as the impact that a person, organisation, company, activity, community has on the environment. E.g. the amount of natural resources they use, and the amount of harmful gases and other waste they produce through their activities.
9. See Endnote 5.
10. **The prevalence of blindness in Takeo province** is estimated to be 3.4% in people aged 50 years and over, whereas 16.9% or 21,000 people have visual impairment. Reference: Morchen M, Langdon T, Keefe J. Prevalence of Blindness and Cataract Surgical Outcomes in Takeo Province, Cambodia. *Asia Pac J Ophthalmol* 2015; 4:25-31.
11. See Endnote 10.
12. '**Universal Design**' is the design and composition of an environment so that it can be accessed, understood and used to the greatest extent possible by all people regardless of their age, size, ability or disability. An environment (or any building, product, or service in that environment) should be designed to meet the needs of all people who

wish to use it. This is not a special requirement for the benefit of only a minority of the population. It is a fundamental condition of good design. If an environment is accessible, usable, convenient and pleasurable to use, then everyone benefits. By considering the diverse needs and abilities of all people throughout the design process, Universal Design creates products, services and environments which meet peoples' needs. Simply put, Universal Design is good design.

13. See Endnote 1.

14. **Lao stoves project.**

[http://www.cambodia.geres.eu/our\\_projects/new\\_lao\\_stove](http://www.cambodia.geres.eu/our_projects/new_lao_stove)

15. **CBM's Inclusive Eye Health resources**

<http://www.cbm.org/Inclusive-Development-246768.php>

16. See Endnote 3.

17. See Endnote 1.

18. **Choosing building materials with a low embodied energy** will significantly reduce the greenhouse gas emissions associated with construction. Embodied energy is the energy used to extract and process the needed raw resources, and then to make and transport that building material. Embodied energy varies significantly, from around two gigajoules per tonne for concrete, to hundreds of gigajoules per tonne for aluminium.

Notes

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## Notes

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## CBM AND THE 2030 AGENDA FOR SUSTAINABLE DEVELOPMENT:

### Improving Environmental Sustainability and Accessibility in Eye Health

Creating environmentally friendly,  
accessible and welcoming eye hospitals  
and other facilities

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This case study booklet can be found at:

[http://www.cbm.org/article/  
downloads/54741/Improving\\_  
Environmental\\_Sustainability\\_and\\_  
Accessibility\\_in\\_Eye\\_Health.pdf](http://www.cbm.org/article/downloads/54741/Improving_Environmental_Sustainability_and_Accessibility_in_Eye_Health.pdf)