In Module 14 we’re going to look at climate change mitigation and the range of co-benefits mitigation can provide.
Key messages in Module 14

- Climate change mitigation is vital, & the health sector has an important role to play
- The framing of mitigation activities with relevance to health as ‘co-benefits’ or ‘win-win’ is strategic & useful
- Many co-benefits projects are underway, & need to be scaled up where possible

The three key messages that we’ll discuss in this module on mitigation and co-benefits are:

**CLICK** to animate each message

1. Given our rapidly increasing GHG emissions, we need to focus on ways in which we can reduce (and in an ideal world, reverse) this trajectory.
2. The health sector can be more involved in this conversation, particularly via the framing of climate change mitigation and health activities as ‘win-win’ or projects with co-benefits. In addition it is important for the health sector to reduce its emissions, by greening hospitals and other health care facilities, for example.
3. It is useful to know the sort of co-benefits projects are currently occurring, to see to what extent we can incorporate these in our own contexts (and in particular, scale these up).
This module on mitigation and co-benefits has two key areas:

Firstly, we will look at the concept of mitigation, and provide an overview of different sectors’ contributions to emissions, and why it is so important to reduce our emissions.

Secondly, we will discuss the co-benefits of climate change mitigation for the environment, and for human health. This framing of health and mitigation activities as ‘co-benefits’ (or ‘win-win’ strategies) has arisen in the last twenty years or so, and in the last ten years the health sector has started to focus more research on demonstrating co-benefits. Put simply, co-benefits refers to when GHG emissions can be reduced in ways that also generate health benefits. In this section we will discuss examples of win-win/co-benefit approaches to climate change and health relevant to the SE Asia and Western Pacific regions, and we will have a chance to discuss potential trade-offs that we need to consider when designing mitigation.
activities relevant to health.
Let’s start into Module 14 by looking at some of the basic concepts around mitigation.
To begin with – some definitions:

Mitigation is the reduction of greenhouse gas emission sources, or the enhancement of greenhouse gas emission sinks. Examples of the reduction of GHGs would be sourcing electricity from renewable sources rather than from coal or oil, or switching off hospitable lighting in unused rooms to reduce electricity use from coal-fire powered electricity generators. An example of enhancing greenhouse gas emission sinks is planting forests, which take up carbon dioxide.

**CLICK** - Mitigation is very relevant for the health sector – as mentioned earlier, reducing GHG emissions can be done in ways that promote and protect health

**CLICK** - All sectors are able to reduce their GHG emissions, whether in energy supply, forestry or agriculture.
Brainstorm 3 types of mitigation activities your assigned sector could take to reduce greenhouse gas emissions

GROUP WORK:

Assign each table one of the sectors listed on the previous slide: Energy supply, Industry, Waste, Transport, Agriculture, Buildings, Forestry/forests. (double up if needed) Point out the markers and
blank A4 paper in the middle of the table.

“For your assigned sector, please brainstorm 3 types of mitigation activities this sector could take to reduce greenhouse gas emissions. You’ll have two and a half minutes as a group. If you have more than three ideas, go for it! Are there any questions? (if not) Ok, start brainstorming for this particular sector.”
Give a time warning at 2 mins: “You have another 30 seconds to finish off your brainstorm. Please also decide on one representative for your group, who’ll report back your three mitigation activities.”

At 2 mins 30 secs: “Ok, please finish your brainstorm. Could I please have the representative from this table tell us which sector you had, and the three activities you came up with that would reduce greenhouse gas emissions from this sector?”

Repeat for each table, writing up all mitigation activities on a flipchart page (or having someone – another trainer or a participant - you’ve asked to scribe for you write each one down). If an activity is repeated by another group, tick the activity where it was first written, to show that many activities are possible across a range of sectors.

“Thank you for all your great mitigation ideas. We’ll put these up on the wall so you can go
back to the ideas that other groups came up with. I’d encourage them to keep this wide range of mitigation activities in mind when you’re back in your own countries working to mitigate climate change. We’ll also look at mitigation options for the health sector in the next section of this module.”
The main message to take from this graph is that emissions of air pollutants, including carbon dioxide and methane and other more ‘conventional’ air pollutants such as nitrogen dioxide are increasing, and these have negative impacts on health.

Many — but not all — mitigation measures reduce these air pollutants. A couple of mitigation examples include the reduction of cattle grazing (and other ruminant animals) – these animals produce methane; and the reduction of coal-fired power stations, which emit carbon dioxide.

Source: IPCC WGIII AR5
Now turning to sectoral differences in relation to emissions. This image from the AR5 of the IPCC shows total anthropogenic GHG emissions (GtCO₂eq / yr) by economic sectors.

Indirect emissions, shown on the right, are those that result from the generation of electricity and heat; direct emissions by sector are shown on the left.

We can see here that the agriculture, forestry and other land use sector emits the largest amount of direct emissions, closely followed by industry.

The IPCC presents many suggestions for reducing GHG – lets take one sector – transport:

The IPCC notes that “Integrated urban planning, transit-oriented development, more compact urban form that supports bicycling and walking, can all lead to modal shifts as can, in the longer term, urban redevelopment and investments in new
infrastructure such as high-speed rail systems that reduce short-haul air travel demand.”
These changes have the potential to cut transport GHG emissions by 20% to 50% in 2050
compared to baseline. We also now recognise the public health benefits of active transport,
which is also briefly reflected on in this chapter of the IPCC report.
This slide, and the next one, make the point that the countries primarily responsible for greenhouse emissions are not the countries that so far are most affected by climate change.

This is a density-equaling cartogram with countries scaled according to cumulative emissions in billion tonnes carbon equivalent in 2002.

The total amount of greenhouse gases emitted by a country is closely correlated with national wealth, measured in conventional terms such as total GDP. This map illustrates how some countries, and some regions of the world, have been very modest contributors to total greenhouse emissions, and this is mostly a reflection of differentials in wealth. (Note that these figures are not expressed per capita, so population size is also a factor. New Zealand, for instance, escapes notice in this cartogram, but is the fifth heaviest emitter in the OECD when its small population is taken into account.)
Here is another density-equaling cartogram, showing WHO regions scaled according to estimated mortality in the year 2000, attributable to the climate change that occurred from 1970s to 2000.

The map is quite different to the one we have just seen: the burden of disease falls mostly on the poorest regions, Africa in particular.

For obvious reasons, the impacts of storms and flooding and other climate-sensitive health problems, are greatest where material resources are in shortest supply.

The main message from this graph is that recent studies show that cumulative carbon dioxide emission is a useful metric for linking emissions to impacts. We can see here that an increase in cumulative emissions is related to an increase in global mean temperature change.

*Background note for trainer* - [Error bars reflect uncertainty in carbon cycle and climate responses to carbon dioxide emissions due to observational constraints and the range of model results. Cumulative carbon emissions are in teratonnes of carbon (trillion metric tonnes or 1,000 gigatonnes).]

Source: http://www.nap.edu/catalog/12877/climate-stabilization-targets-emissions-concentrations-and-impacts-over-decades-to
What we can see in this table is that global temperature change can be linked both to concentrations of atmospheric carbon dioxide and to accumulated carbon emissions. The green numbers represent the low end of the range, and the red represents the high end of the range. The black bolded numbers represent the best estimate of carbon dioxide concentration, which is then linked to the associated global average warming.

Because there are many factors that shape climate, uncertainty in the climate sensitivity is large; the possibility of greater warming, implying additional risk, cannot be ruled out, and smaller warmings are also possible. Choices about stabilization targets will depend upon value judgments regarding the degree of acceptable risk.
Co-benefits of mitigation for health & the environment
Mitigation & co-benefits – IPCC AR5:

Co-benefits = climate mitigation + health gains from well-chosen health policies

WGII of the IPCC had its first major and serious focus on co-benefits in the AR5.

By co-benefits we mean... (explain formula listed)

On the next slide I will present some examples of mitigation strategies that have health co-benefits
Co-benefit examples

- **Active transport:** ↓carbon emissions, ↑health

- **Reduced intake animal (ruminant) products:**
  ↓methane emissions, ↑health

- **Clean energy sources:**
  ↓carbon emissions, ↑health

- **Access to reproductive health services:**
  ↓of planetary pressures (e.g. food, water), maternal & child health

Here are some co-benefit examples:

- Active transport – such as cycling rather than driving a car, results in reduction in carbon emissions as well as improved health;
- Reducing consumption of meat (ruminants that emit methane) results in fewer methane emissions as well as improved (mainly heart) health
- Clean energy sources -such as windpower and solar power - reduce carbon emissions and have the benefit to health of reducing air pollution via less reliance on dirtier energy sources, such as coal-fired power plants.
- Population growth influences the consumption of resources and emissions of Climate-Altering Pollutants (such as methane, carbon dioxide etc.) (CAPs) (Cohen, 2010). Slowing population growth through lowering fertility, as might be achieved by increasing access to family planning, has been associated with improved maternal and child health – the co-benefit - in two main ways: increased birth spacing and reducing births by very young and old mothers.
‘Meatless Monday’ is an example of a successful social marketing approach. This started in Europe, and has since extended to parts of Asia and the Pacific.
Other mitigation options: technological, behavioural

• Chocolate company working with farmers to reduce methane emissions
• Production of the milk is responsible for 60% of chocolate’s GHG emissions
• Investigating changing the diet of the cows
• Example of industry collaborating with partners

And keeping with the animal theme (although the health benefits of chocolate are debatable!) Cadbury is working with its 65 dairy farmers in Wiltshire to reduce the emissions of their animals. Production of the famous glass-and-a-half of milk in every bar is responsible for 60% of the chocolate’s carbon emissions, according to experts at the Carbon Trust who audited the carbon emissions from the company’s products. Cadbury has sent the farmers a guide for low carbon dairy farming, which includes advice on changing the diet of the cows to cut their eructations (belches).
The Health Care Waste Management Center was established in 2011 at Bir Hospital, Kathmandu. It was endorsed by the WHO with technical assistance from the Nepal Public Health Foundation and Health Care Without Harm. The Center is based on three pillars – waste management, injection safety, and mercury elimination. Prior to the Center’s development on the hospital grounds, the site was used for dumping waste.

The Center has three main functions – i) recycling; ii) biological treatment of food/human waste and iii) safe storage of mercury.

The waste that is able to be recycled, including plastics, paper, rubber and glass, is segregated and sold, while the non-recyclable infectious waste - including bandages and cotton – is treated in the autoclave for sterilisation and then placed in the vermicomposter (worm farm). A trolley is fitted with colour-coded buckets for risk and non-risk waste collection within the hospital. Approximately 80-100 kilograms of waste is collected per day from the hospital.
The second function of the Center is a biogas plant which manages biodegradable waste, including food and human waste (e.g. from surgical operations). The plant then produces fertiliser (slurry) - which will eventually be sold to farmers once safety tests are completed - and methane and carbon dioxide, which is currently being used to run the Center’s kitchen and autoclaves. Future plans include the purchase of a generator for electricity to power the street lamps within the hospital compound.

The third function is to safely store mercury.

Many benefits are observable from the Center’s operation, ranging from climate change mitigation to capacity development. The total reduction of greenhouse gases within the hospital as a result of the Center’s activities was estimated to be 75.8 tonnes of carbon dioxide per annum, equating to $US531. In 2012, 79% of total waste was being recycled in the hospital. The cost of setting up the Center was approximately $US6000 and it is expected that this cost will be paid back in three to four years. An additional benefit of the Center is that burn injury patients are trained to make handicrafts for purchase from the plastic waste.
Trade-offs??

Co-benefits = climate mitigation + health gains from well-chosen health policies
What changes to public health practice could you implement in your country that also have mitigation benefits for the climate?

Groupwork –

“In this short exercise, I’d like you to reflect on the

Think about which of the activities we’ve discussed might be appropriate for mitigation in your setting, ensuring that these have win-wins. For example, could you use E-Health more widely, moving away from in-situ visits to medical facilities by accessing health information online, which has benefits for health, but also for the environment in reducing travel emissions?” (PLoS Holmner & Ebi).

“Make a list of possible changes to public health practice that would also act as mitigation activities in the notes next to this slide in your handouts. I’ll give you 3 minutes for this, working on your own. You’ll then have the opportunity to share
your ideas with a colleague at the end.”

At **2 mins 30 secs**: “Please finish off your notes in the next 30 seconds.”

“Ok, now that you have a list of public health changes that are win-win in also being mitigation activities for your country, I’ll ask you to turn to the person next to you and share some of the activities you came up with that could be possible in your country. You’ll have a minute each to remind your colleague of your country and to give an overview of the options you came up with. The other person should listen and ask questions if they need to, to understand how these activities have co-benefits.”

(reset timer)

At **1 min**: “Please swap over now, so that the other person is giving an outline of the mitigation activities they came up with that could be implemented in their country, and the co-benefits these would provide.”

At **2 mins**: “Ok, please finish your conversation now. Thank you for sharing your mitigation ideas. I hope many of these will be implemented in your countries with your support.”
So let’s finish off Module 14 now. A reminder that in this module we’ve:

Firstly looked at the concept of mitigation, an overview of different sectors’ contributions to emissions, and why it is so important to reduce our emissions.

Secondly, we discussed the co-benefits of climate change mitigation for the environment, and for human health. This framing of health and mitigation activities as ‘co-benefits’ (or ‘win-win’ strategies) has arisen in the last twenty years or so, and in the last ten years the health sector has started to focus more research on demonstrating co-benefits. We looked at examples of win-win/co-benefit approaches to climate change and health relevant to the SE Asia and Western Pacific regions, and we also discussed potential trade-offs that we need to consider when designing mitigation activities relevant to health.
Learning from Module 14

• Climate change mitigation is vital, & the health sector has an important role to play
• The framing of mitigation activities with relevance to health as ‘co-benefits’ or ‘win-win’ is strategic & useful
• Many co-benefits projects are underway, & need to be scaled up where possible

The three key messages to take away from this module are:

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1. Given our rapidly increasing GHG emissions, we need to focus on ways in which we can reduce (and in an ideal world, reverse) this trajectory.
2. The health sector can be more involved in this conversation, particularly via the framing of climate change mitigation and health activities as ‘win-win’ or projects with co-benefits. In addition it is important for the health sector to reduce its emissions, by greening hospitals and other health care facilities, for example.
3. It is useful to know the sort of co-benefits projects are currently occurring, to see to what extent we can incorporate these in our own contexts (and in particular, scale these up).
Next we’ll be looking at adapting to climate change – a concept closely linked with climate change mitigation.

*NB: Ensure that your flipchart pages from the earlier brainstorming exercise are put up on the wall, as these will be viewed tomorrow morning.*