



D-MAVT CARES

New sustainable Focus Projects

D MAVT
Departement für Maschinenbau und Verfahrenstechnik
Department of Mechanical and Process Engineering

D-MAVT CARES – Marco Mazzotti, marcom@ethz.ch | February 18th, 2019 | 1

D MAVT

Funded via D-MAVT Internal Carbon Price
(per ton CO₂ emitted due to air travel).

Compensation

Acquisition of offset certificates for residual emissions.

Awareness

Information about pros and cons of alternative travelling options.

Reduction

Significant reduction of CO₂ emissions due to air travel.

Education on

Competitive funding for a mix of bottom-up student projects.

Sustainability

Student projects tackle the Sustainable Development Goals.

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Sustainable development

- Sustainable Development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs (World Commission on Environment and Development, Our common future, Brundtland Report, 1987).
- Sustainable Development is a normative framework embracing (J. D. Sachs, The age of sustainable development, 2015):
 - economic development;
 - social inclusion;
 - environmental sustainability;
 - good (public/private) governance.

D-MAVT CARES calls for Focus Projects proposals addressing SDGs (HS2019 – FS2020)



<https://www.un.org/sustainabledevelopment/>

D-MAVT CARES calls for Focus Projects proposals addressing SDGs (HS2019 – FS2020)

- Project proposals (up to 2 pages, including budget, by 28.2.2019) developed by students independently (at the time of proposal submission the team does not need to be fully formed yet).
- Proposals evaluated by a specific MAVT evaluation committee.
- Scientific and educational quality according to ETH/MAVT criteria.
- Fulfilment of Focus Projects criteria (<https://www.mavt.ethz.ch/studies/bachelor.html>).
- Addressing scientific and engineering challenges for one or more of the seventeen Sustainable Development Goals.
- Sensible budget.
- Feasible research plan.
- Identification of potential supervisor(s).

Focus Projects

- Teams of 3 to 8 students work during 5th and 6th semester on solving a specific problem by realizing a product/solution, thus obtaining their BS degree (classes are selected *ad hoc*).
- Based on a specific need, all processes in product development are conducted in a realistic manner: marketing, conception, design, engineering, simulation, prototypes, and production.
- Proposed by students within D-MAVT CARES, instead of by professors, with the aim of addressing one or more of the seventeen UN Sustainable Development Goals (2015).

Process



Project Proposal (2-pages)

- Team description
 - Current team and ideal size
- Budget
 - Need help: AV MAVT
- List of potential supervisor(s)
- Brief project description
 - Motivation
 - Objectives
 - Vision of the final product
- Rough project plan
 - 4-5 sub goals
- Which Sustainable Development Goals are addressed and how



1 NO POVERTY



NO POVERTY: WHY IT MATTERS

What's the goal here?

To end poverty in all its forms everywhere by 2030.

Why?

More than 700 million people, or 11% of the world population, still live in extreme poverty and is struggling to fulfil the most basic needs like health, education, and access to water and sanitation, to name a few..

Yes. The overwhelming majority of people living on less than \$1.90 a day

live in Southern Asia and sub-Saharan Africa and they account for about 70 per cent of the global total of extremely poor people.

In 2017, economic losses attributed to natural disasters were estimated at over \$300 billion, among the highest losses in recent years.

However, this issue also affects developed countries. Right now there are 30 million children growing up poor in the world's richest countries.

By 2030
167 million
children
will live in
extreme
poverty
if the world
doesn't take
action
to improve
health
and education

Why is there so much poverty in the world?

Poverty has many dimensions, but its causes include unemployment, social exclusion, and high vulnerability of certain population to disasters, diseases and other phenomena which prevent them from being productive.

I'm not poor. Why should I care about other people's economic situation?

There are many reasons, but in short, because as human beings, our well-being is linked to each other. Growing inequality is detrimental to economic growth and undermines social cohesion, increasing political and social tensions and, in some circumstances, driving instability and conflicts.

Can we actually achieve this goal?

Yes. To end extreme poverty worldwide in 20 years, economist Jeffrey Sachs calculated that the total cost per year would be about \$175 billion. This represents less than one percent of the combined income of the richest countries in the world.

So what can I do about it?

If you are a young person:

Your active engagement in policymaking can make a difference in addressing poverty. It ensures that your rights are promoted and that your voice is heard, that inter-generational knowledge is shared, and that innovation and critical thinking are encouraged at all ages to support transformational change in people's lives and communities.

If you are a policymaker:

Governments can help create an enabling environment to generate productive employment and job opportunities for the poor and the marginalized. They can formulate strategies and fiscal policies that stimulate pro-poor growth, and reduce poverty.

If you work in the private sector:

The private sector, as an engine of economic growth, has a major role to play in determining whether the growth it creates is inclusive and hence contributes to poverty reduction. It can promote economic opportunities

for the poor, focusing on segments of the economy where most of the poor are active, namely on micro and small enterprises and those operating in the informal sector.

If you are part of the science and academic community:

The academic and education community have a major role in increasing the awareness about the impact of poverty. Science provides the foundation for new and sustainable approaches, solutions and technologies to tackle the challenges of reducing poverty and achieving sustainable development. The contribution of science to end poverty has been significant. For example, it has enabled access to safe drinking water, reduced deaths caused by water-borne diseases, and improved hygiene to reduce health risks related to unsafe drinking water and lack of sanitation.

To find out more about Goal #1 and other Sustainable Development Goals visit:

<http://www.un.org/sustainabledevelopment>



SUSTAINABLE DEVELOPMENT GOALS



© UN Photo / Albert Gonzalez-Farman

ZERO HUNGER: WHY IT MATTERS

What's the goal here?

To end hunger, achieve food security and improved nutrition and promote sustainable agriculture

Why?

Extreme hunger and malnutrition remains a barrier to sustainable development and creates a trap

from which people cannot easily escape. Hunger and malnutrition mean less productive individuals, who are more prone to disease and thus often unable to earn more and improve their livelihoods. There are nearly 800 million people who suffer from hunger worldwide, the vast majority in developing countries.

2 ZERO HUNGER



A profound change of the global food and agriculture system is needed to nourish today's **795 million** hungry + the additional **2 billion** increase in global population expected by **2050**

How many people go hungry?

New evidence continues to signal that the number of hungry people in the world is growing, reaching 821 million in 2017 or one in every nine people.

Hunger has been on the rise over the past three years, returning to levels from a decade ago. This reversal in progress sends a clear warning that more must be done and urgently if the Sustainable Development Goal of Zero Hunger is to be achieved by 2030.

The situation is worsening in South America and most regions of Africa. With enough food to feed everyone on the planet, why are there so many hungry people?

Poor harvesting practices, as well as food wastage have contributed to food scarcity. Wars have also had a negative impact on the availability of food and have led to a destruction of the environment, which is critical to grow food.

Why should I care?

We all want our families to have enough food to eat that is safe and nutritious. A world with zero hunger can positively impact our economies, health, education, equality and social development. It's a key piece of building a better future for everyone. Additionally, with hunger limiting human development, we will not be able to achieve the other sustainable development goals such as education, health and gender equality.

How much will it cost to achieve zero hunger?

We will need an estimated additional \$267 billion per year on average to end world hunger by 2030. There will need to be investments in rural and urban areas and in social protection, so poor people have access to food and can improve their livelihoods.

What can we do to help?

You can make changes in your own life—at home, at work and in the community—by supporting local farmers or markets and making sustainable food choices, supporting good nutrition for all, and fighting food waste.

You can also use your power as a consumer and voter, demanding businesses and governments make the choices and changes that will make Zero Hunger a reality. Join the conversation, whether on social media platforms or in your local communities.

You can join the Global Movement for Zero Hunger by joining the Zero Hunger Challenge (www.zerohunger-challenge.org) to learn more, including more ways to take action!

To find out more about Goal #2 and other Sustainable Development Goals, visit:

<http://www.un.org/sustainabledevelopment>



3 GOOD HEALTH AND WELL-BEING



GOOD HEALTH AND WELL-BEING: WHY IT MATTERS

What's the goal here?

To ensure healthy lives and promote well-being for all at all ages.

Why?

Ensuring healthy lives and promoting well-being for all at all ages is important to building prosperous societies.

However, despite great strides in improving people's health and well-being in recent years,

inequalities in health care access still persist. More than six million children still die before their fifth birthday each year, and only half of all women in developing regions have access to the health care they need.

Epidemics like HIV/AIDS thrive where fear and discrimination limit people's ability to receive the services they need to live healthy and productive lives.

Spending
\$1 billion in
immunization
coverage
can save
1 million
children's lives
each year.

Access to good health and well-being is a human right, and that is why the Sustainable Development Agenda offers a new chance to ensure that everyone can access the highest standards of health and health care—not just the wealthiest.

What progress have we made so far?

Major progress has been made in several areas, including in child and maternal health as well as in addressing HIV/AIDS, malaria and other diseases.

Maternal mortality has fallen by almost 50 per cent since 1990; measles vaccines have averted nearly 15.6 million deaths since 2000; and 13.6 million people had access to antiretroviral therapy by the end of 2014..

We may have come a long way, but we still have a longer way to go. Real progress means achieving universal health coverage; making essential medicines and vaccines affordable; ensuring that women have full access to sexual and reproductive health care; and ending all preventable deaths of children.

How much will it cost to achieve these targets?

Ensuring healthy lives for all requires a strong commitment, but the benefits outweigh the cost. Healthy people are the foundation for healthy economies.

For example, if we spent \$1 billion in expanding immunization coverage against influenza, pneumonia and other preventable diseases, we could save 1 million children's lives each year. In the past decade, improvements in health and health care led to a 24 per cent increase in income growth in some of the poorest countries.

The cost of inaction is greater—millions of children will continue to die from preventable diseases, women will die in pregnancy and childbirth, and health care costs will continue to plunge millions of people into poverty. Noncommunicable diseases alone will cost low- and middle-income countries more than \$7 trillion in the next 15 years.

What can I do to help?

You can start by promoting and protecting your own health and the health of those around you, by making well-informed choices, practicing safe sex and vaccinating your children.

You can raise awareness in your community about the importance of good health, healthy lifestyles as well as people's right to quality health care services.

Take action through schools, clubs, teams and organizations to promote better health for all, especially for the most vulnerable such as women and children.

You can also hold your government, local leaders and other decision-makers accountable to their commitments to improve people's access to health and health care.

To find out more about Goal #3 and the other Sustainable Development Goals, visit:

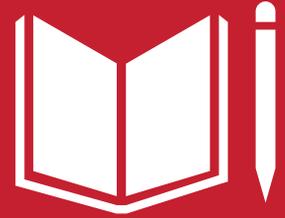
<http://www.un.org/sustainabledevelopment>



**SUSTAINABLE
DEVELOPMENT** **GOALS**



4 QUALITY EDUCATION



QUALITY EDUCATION: WHY IT MATTERS

What is the goal here?

Ensure inclusive and quality education for all and promote lifelong learning.

Why does education matter?

Education is the key that will allow many other Sustainable Development Goals (SDGs) to be achieved. When people are able to get quality education they can break from the cycle of poverty. Education therefore helps

to reduce inequalities and to reach gender equality. It also empowers people everywhere to live more healthy and sustainable lives. Education is also crucial to fostering tolerance between people and contributes to more peaceful societies.

So through education, people can get better jobs and have better lives?

Yes, education reduces inequality. Using data for 114 countries in the

While enrolment in primary education in developing countries has reached **91 per cent**, **57 million** children remain out of school

1985–2005 period, one extra year of education is associated with a reduction of the Gini coefficient by 1.4 percentage points.

But hasn't a lot of progress been made over the last few years on education?

Yes, enrolment in primary education in developing countries has reached 91%. According to the UNESCO Institute for Statistics (UIS Data Centre), since 2000, the percentage of out-of-school children among primary-school-age children has declined from 40% to 22% in sub-Saharan Africa and from 20% to 6% in South Asia.

Where are people struggling the most to have access to education?

More than half of children that have not enrolled in school live in sub-Saharan Africa, which makes it the region with the largest number of out-of-school children in the world. And this region has a very young population so it will have to provide basic

education to 444 million children between the ages of 3 and 15 in 2030, which is 2.6 times the numbers enrolled today.

Are there groups that have a more difficult access to education?

Yes, women and girls are one of these groups. About one-third of countries in the developing regions have not achieved gender parity in primary education. In sub-Saharan Africa, Oceania and Western Asia, girls still face barriers to entering both primary and secondary school. These disadvantages in education also translate into lack of access to skills and limited opportunities in the labour market for young women.

What can we do?

- Ask our governments to place education

as a priority in both policy and practice.

- Lobby our governments to make firm commitments to provide free primary school education to all, including vulnerable or marginalized groups.
- Encourage the private sector to invest resources in the development of educational tools and facilities
- Urge NGOs to partner with youth and other groups to foster the importance of education within local communities

To find out more about Goal #4 and other Sustainable Development Goals, visit:

<http://www.un.org/sustainabledevelopment>



5 GENDER EQUALITY



GENDER EQUALITY: WHY IT MATTERS

What's the goal here?

To achieve gender equality and empower all women and girls.

Why?

Women and girls represent half of the world's population and therefore also half of its potential. But, today gender inequality persists everywhere and stagnates social progress.

As of 2014, 143 countries have guaranteed equality between men and women in their Constitutions but 52 have yet to take this step.

What happens if gender equality is not ensured?

Inequalities faced by girls can begin right at birth and follow them all their lives. In some countries, girls are deprived of access to health care or proper nutrition, leading to a higher mortality rate.

As girls move into adolescence, gender disparities widen. Child marriage affects girls far more than boys. Globally, nearly 15 million girls under age 18 are married every year—or 37,000 each day.

On average,
less than
1 in 3
senior and
middle
management
positions
are held by
women

Marrying young also affects girls' education. About one third of developing countries have not achieved gender parity in primary education. In sub-Saharan Africa, Oceania and Western Asia, girls still face barriers to entering both primary and secondary school.

How does gender inequality affect women?

Disadvantages in education translate into lack of access to skills and limited opportunities in the labour market.

Women's and girls' empowerment is essential to expand economic growth and promote social development. The full participation of women in labor forces would add percentage points to most national growth rates—double digits in many cases.

Are there any other gender-related challenges?

Yes. Worldwide, 35 per cent of women between 15-49 years of age have experienced physical and/or sexual intimate partner violence or non-partner sexual violence.

1 in 3 girls aged 15-19 have experienced some form of female genital mutilation/

cutting in the 29 countries in Africa and the Middle East, where the harmful practice is most common with a high risk of prolonged bleeding, infection (including HIV), childbirth complications, infertility and death.

The [Spotlight Initiative](#), an EU/UN partnership, is a global, multi-year initiative focused on eliminating all forms of violence against women and girls (VAWG).

But, why should gender equality matter to me?

Regardless of where you live in, gender equality is a fundamental human right. Advancing gender equality is critical to all areas of a healthy society, from reducing poverty to promoting the health, education, protection and the well-being of girls and boys.

Investing in education programmes for girls and increasing the age at which they marry can return \$5 for every dollar spent. Investing in programs improving income-generating activities for women can return \$7 dollars for every dollar spent.

What can we do to fix these issues?

If you are a girl, you can stay in school, help empower your female classmates to do the same and fight for your right to access sexual and reproductive health services.

If you are a woman, you can address unconscious biases and implicit associations that form an unintended and often an invisible barrier to equal opportunity.

If you are a man or a boy, you can work alongside women and girls to achieve gender equality and embrace healthy, respectful relationships.

You can fund education campaigns to curb cultural practices like female genital mutilation and change harmful laws that limit the rights of women and girls and prevent them from achieving their full potential.

To find out more about Goal #5 and other Sustainable Development Goals, visit:

<http://www.un.org/sustainabledevelopment>



© UN Photo / Kibae Park

6 CLEAN WATER AND SANITATION



CLEAN WATER AND SANITATION: WHY IT MATTERS

What's the goal here?

To ensure access to safe water sources and sanitation for all.

Why?

Access to water, sanitation and hygiene is a human right, yet billions are still faced with daily challenges accessing even the most basic of services.

Around 1.8 billion people globally use a source

of drinking water that is fecally contaminated. Some 2.4 billion people lack access to basic sanitation services, such as toilets or latrines. Water scarcity affects more than 40 per cent of the global population and is projected to rise. More than 80 per cent of wastewater resulting from human activities is discharged into rivers or sea without any treatment, leading to pollution.

3 in 10 people lack access to safely managed drinking water services

What are the effects of this?

Water and sanitation-related diseases remain among the major causes of death in children under five; more than 800 children die every day from diarrhoeal diseases linked to poor hygiene.

Proper water and sanitation is a key foundation for achieving the Sustainable Development Goals, including good health and gender equality.

By managing our water sustainably, we are also able to better manage our production of food and energy and contribute to decent work and economic growth. Moreover, we can preserve our water ecosystems, their biodiversity, and take action on climate change.

What would it cost to correct the problem?

A study by the World Bank Group, UNICEF and the World Health Organization estimates that extending basic water and sanitation services to the unserved would cost US\$28.4 billion per year from 2015 to 2030, or 0.10 per cent of the global product

of the 140 countries included in its study.

What would it cost if we don't correct the problem?

The costs are huge—both for people and for the economy.

Worldwide, more than 2 million people die every year from diarrhoeal diseases. Poor hygiene and unsafe water are responsible for nearly 90 per cent of these deaths and mostly affect children.

The economic impact of not investing in water and sanitation costs 4.3 per cent of sub-Saharan African GDP. The World Bank estimates that 6.4 per cent of India's GDP is lost due to adverse economic impacts and costs of inadequate sanitation.

Without better infrastructure and management, millions of people will continue to die every year and there will be further losses in biodiversity and ecosystem resilience, undermining prosperity and efforts towards a more sustainable future.

What can we do?

Civil society organizations should work to keep governments accountable, invest in water research and development, and promote the inclusion of women, youth and indigenous communities in water resources governance.

Generating awareness of these roles and turning them into action will lead to win-win results and increased sustainability and integrity for both human and ecological systems.

You can also get involved in the World Water Day and World Toilet Day campaigns that aim to provide information and inspiration to take action on hygiene issues.

To find out more about Goal #6 and the other Sustainable Development Goals, visit:

<http://www.un.org/sustainabledevelopment>

wateractiondecade.org



7 AFFORDABLE AND CLEAN ENERGY



AFFORDABLE AND CLEAN ENERGY: WHY IT MATTERS

What's the goal here?

To ensure access to affordable, reliable, sustainable and modern energy for all.

Why?

Our everyday lives depend on reliable and affordable energy services to function smoothly and to develop equitably.

A well-established energy system supports all sectors: from businesses, medicine and education to agriculture,

infrastructure, communications and high-technology. Conversely, lack of access to energy supplies and transformation systems is a constraint to human and economic development.

I have access to electricity. Why should I care about this goal?

For many decades, fossil fuels such as coal, oil or gas have been major sources of electricity production, but burning carbon fuels produces large amounts of

If people worldwide switched to energy efficient lightbulbs, the world would save **\$120 billion** annually

greenhouse gases which cause climate change and have harmful impacts on people's well-being and the environment. This affects everyone, not just a few. Moreover, global electricity use is rising rapidly. In a nutshell, without a stable electricity supply, countries will not be able to power their economies.

How many people are living without electricity?

Just under 1 billion people of the world's population do not have access to electricity. 16 out of 20 countries with the largest deficits in electricity access are in Africa.

Without electricity, women and girls have to spend hours fetching water, clinics cannot store vaccines for children, many schoolchildren cannot do homework at night, and people cannot run competitive businesses. The health and well-being of some 3 billion people are adversely impacted by the lack of clean cooking fuels, such as wood, charcoal, dung and coal, which causes indoor air pollution.

What would it cost to switch to more sustainable energy?

The world needs to triple its investment in sustainable energy infrastructure per year, from around \$400 billion now to \$1.25 trillion by 2030.

Regions with the greatest energy deficits—Sub-Saharan Africa and South Asia—need our help to improve energy access. That includes pushing harder to find clean, efficient, and affordable alternatives to health-damaging cook stoves.

What can we do to fix these issues?

Countries can accelerate the transition to an affordable, reliable, and sustainable energy system by investing in renewable energy resources, prioritizing energy efficient practices, and adopting clean energy technologies and infrastructure.

Businesses can maintain and protect ecosystems to be able to use and further develop hydropower sources of electricity and bioenergy, and commit to

sourcing 100% of operational electricity needs from renewable sources.

Employers can reduce the internal demand for transport by prioritizing telecommunications and incentivize less energy intensive modes such as train travel over auto and air travel.

Investors can invest more in sustainable energy services, bringing new technologies to the market quickly from a diverse supplier base.

You can save electricity by plugging appliances into a power strip and turning them off completely when not in use, including your computer. You can also bike, walk or take public transport to reduce carbon emissions.

To find out more about Goal #7 and other Sustainable Development Goals, visit:

<http://www.un.org/sustainabledevelopment>





UN Photo / Eskinder Debebe

8 DECENT WORK AND ECONOMIC GROWTH



DECENT WORK AND ECONOMIC GROWTH: WHY IT MATTERS

What's the goal here?

To promote inclusive and sustainable economic growth, employment and decent work for all.

Why?

Poverty eradication is only possible through stable and well-paid jobs. Nearly 2.2 billion people live below the US\$1.90 poverty line.

How many people are unemployed?

According to the International Labour

Organization (ILO), 5.6 per cent of the global population were unemployed as of 2017. In 2018, the total number of unemployed people remains high - above 192 million - and it is harder to find decent jobs.

How many jobs are needed?

470 million jobs are needed globally for new entrants to the labour market between 2016 and 2030, just to keep up with the growth of the global working age

30 million:
Number of
jobs required
every
year for new
entrants to the
labour market
to keep up with
the growth
of the global
working age
population.

population. That's around 30 million per year.

So if they all got a job will extreme poverty end?

In addition to creating jobs, we also need to improve conditions for the some 783 million women and men who are working, but not earning enough to lift themselves and their families out of poverty.

In addition, women and girls must enjoy equal access to equal opportunities with men and boys for employment.

I have a job. Why does this matter to me?

Society as a whole benefits when more people are being productive and contributing to their country's growth. Productive employment and "decent work" are key elements to achieving fair globalization and poverty reduction. In addition, unemployment can lead to unrest and disrupt peace if it is left unaddressed.

What does "decent work" mean?

Decent work means opportunities for everyone to get work that is

productive and delivers a fair income, security in the workplace and social protection for families, better prospects for personal development and social integration. It is also important that all women and men are given equal opportunities in the workplace.

A continued lack of decent work opportunities, insufficient investments and under-consumption lead to an erosion of the basic social contract underlying democratic societies: that all must share in progress.

What can we do to fix these issues?

Providing youth the best opportunity to transition to a decent job calls for investing in education and training of the highest possible quality, providing youth with skills that match labour market demands, giving them access to social protection and basic services regardless of their contract type, as well as levelling the

playing field so that all aspiring youth can attain productive employment regardless of their gender, income level or socio-economic background.

Governments can work to build dynamic, sustainable, innovative and people-centred economies, promoting youth employment and women's economic empowerment, in particular, and decent work for all.

Local authorities and communities can renew and plan their cities and human settlements so as to foster community cohesion and personal security and to stimulate innovation and employment.

To find out more about Goal #8 and other Sustainable Development Goals, visit:

<http://www.un.org/sustainabledevelopment>



SUSTAINABLE DEVELOPMENT GOALS



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



INDUSTRY, INNOVATION AND INFRASTRUCTURE: WHY IT MATTERS

What's the goal here?

To build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

Why?

Economic growth, social development and climate action are heavily dependent on investments in infrastructure, sustainable industrial development and technological progress.

In the face of a rapidly changing global economic landscape and increasing inequalities, sustained growth must include industrialization that first of all, makes opportunities accessible to all people, and two, is supported by innovation and resilient infrastructure.

So what's the problem?

Basic infrastructure like roads, information and communication

Industrialization's job multiplication effect has a positive impact on society. Every

one job in manufacturing creates **2.2 jobs** in other sectors.

technologies, sanitation, electrical power and water remains scarce in many developing countries. Approximately 1.2 billion people do not have access to reliable phone services. 2.3 billion people worldwide lack access to basic sanitation and almost 800 million lack access to water. In developing countries, barely 30 per cent of agricultural production undergoes industrial processing.

Why should I care?

It's about our livelihoods. The growth of new industries means improvement in the standard of living for many of us. Also, if industries pursue sustainability, this approach will have a positive effect on the environment. Climate change affects all us.

What is the price of inaction?

The price is steep. Ending poverty would be more difficult, given the industry's role as a core driver of the global development agenda to eradicate poverty and advance sustainable development.

Additionally, failing to improve infrastructure and promote technological innovation could translate into poor health care, inadequate sanitation and limited access to education.

How can we help?

Establish standards and promote regulations that ensure company projects and initiatives are sustainably managed.

Collaborate with NGOs and the public sector to help promote sustainable growth within developing countries.

Think about how industry impacts on your life and well-being and use social media to push for policymakers to prioritize the SDGs.

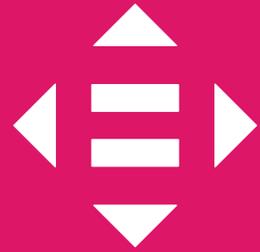
To find out more about Goal #9 and other Sustainable Development Goals, visit:

<http://www.un.org/sustainabledevelopment>





10 REDUCED INEQUALITIES



EQUALITY: WHY IT MATTERS

What's the goal here?

To reduce inequalities within and among countries.

Why?

Inequalities based on income, sex, age, disability, sexual orientation, race, class, ethnicity, religion and opportunity continue to persist across the world, within and among countries. Inequality threatens long-term social and economic development, harms poverty reduction and destroys people's sense of fulfilment and self-worth. This, in turn, can breed crime, disease and environmental degradation.

Most importantly, we cannot achieve sustainable development and make the planet better for all if people are excluded from opportunities, services, and the chance for a better life.

What are some examples of inequality?

An estimated 69 million children under five years of age will die from mostly preventable causes. Rural women are three times more likely to die while giving birth than women in urban centres. Persons with disabilities are the world's largest minority.

We cannot
achieve
sustainable
development
if we
exclude
any part of
the world's
population.

80 per cent of them live in developing countries. Women and girls with disabilities face double discrimination. These are just a few examples, but it is an issue that affects every country in the world.

Why should I need to care about inequality if I don't face any discrimination?

In today's world, we are all interconnected. Problems and challenges, be they poverty, climate change, migration or economic crises are never just confined to one country or region.

Even the richest countries still have communities living in abject poverty. The oldest democracies still wrestle with racism, homophobia and transphobia, and religious intolerance. A recent UNICEF report noted growing inequality among children in several high-income countries.

Global inequality affects us all, no matter who we are or where we are from.

Can we actually achieve equality for everyone in this world?

It can be and should be achieved to ensure a life

of dignity for all. Political, economic and social policies need to be universal and pay particular attention to the needs of disadvantaged and marginalized communities.

Recent statistics have shown that this is possible. Between 2010 and 2016, in 60 out of 94 countries with data, the incomes of the poorest 40 per cent of the population grew faster than those of the entire population.

What can we do?

Reducing inequality requires transformative change. Greater efforts are needed to eradicate extreme poverty and hunger, and invest more in health, education, social protection and decent jobs especially for young people, migrants and other vulnerable communities.

Within countries, it is important to empower and promote inclusive social and economic growth. We can ensure

equal opportunity and reduce inequalities of income if we eliminate discriminatory laws, policies and practices.

Among countries, we need to ensure that developing countries are better represented in decision-making on global issues so that solutions can be more effective, credible and accountable.

Governments and other stakeholders can also promote safe, regular and responsible migration, including through planned and well-managed policies, for the millions of people who have left their homes seeking better lives due to war, discrimination, poverty, lack of opportunity and other drivers of migration.

To find out more about Goal #10 and the other Sustainable Development Goals, visit:

<http://www.un.org/sustainabledevelopment>



SUSTAINABLE DEVELOPMENT GOALS



11 SUSTAINABLE CITIES AND COMMUNITIES



SUSTAINABLE CITIES: WHY THEY MATTER

What's the goal here?

To make cities inclusive, safe, resilient and sustainable

Why?

Half of humanity—3.5 billion people—live in cities today, and this number will continue to grow. Because the future will be urban for a majority of people, the solutions to some of the greatest issues facing humans—poverty, climate change,

healthcare, education—must be found in city life.

What are some of the most pressing challenges that cities face today?

Inequality is a big concern. 833 million people live in slums and this number keeps rising. The levels of urban energy consumption and pollution are also worrying. Cities occupy just 3 per cent of the Earth's land, but account for 60-80 per cent of energy consumption and 75 per

5 billion
people
are projected
to live in
cities by
2030

cent of carbon emissions. Many cities are also more vulnerable to climate change and natural disasters due to their high concentration of people and location so building urban resilience is crucial to avoid human, social and economic losses.

I live in a city but I'm not affected by any of these issues. Why should I care?

All these issues will eventually affect every citizen. Inequality can lead to unrest and insecurity, pollution deteriorates everyone's health and affects workers' productivity and therefore the economy, and natural disasters have the potential to disrupt everyone's lifestyles.

What happens if cities are just left to grow organically?

The cost of poorly planned urbanization can be seen in some of the huge slums, tangled traffic, greenhouse gas emissions and sprawling suburbs all over the world. Slums are a drag on GDP, and lower

life expectancy. By choosing to act sustainably we choose to build cities where all citizens live a decent quality of life, and form a part of the city's productive dynamic, creating shared prosperity and social stability without harming the environment.

Is it expensive to put sustainable practices in place?

The cost is minimal in comparison with the benefits. For example, there is a cost to creating a functional public transport network, but the benefits are huge in terms of economic activity, quality of life, the environment, and the overall success of a networked city.

What can I do to help achieve this goal?

- Take an active interest in the governance and management of your city

- Take notice of what works, and what doesn't in your community
- Advocate for the kind of city you believe you need
- Develop a vision for your building, street, and neighbourhood, and act on that vision. Are there enough jobs? Are you close to healthcare? Can your children walk to school safely? Can you walk with your family at night? How far is the nearest public transport? What's the air quality like? What are your shared public spaces like? The better the conditions you create in your community, the greater the effect on quality of life.

To find out more about Goal #11 and other Sustainable Development Goals, visit:

<http://www.un.org/sustainabledevelopment>



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RESPONSIBLE CONSUMPTION & PRODUCTION: WHY IT MATTERS

What is the goal here?

To ensure sustainable consumption and production patterns

Why?

More people globally are expected to join the middle class over the next two

decades. This is good for individual prosperity but it will increase demand for already constrained natural resources. If we don't act to change our consumption and production patterns, we will cause irreversible damage to our environment.

12 RESPONSIBLE
CONSUMPTION
AND PRODUCTION



If the global population reaches 9.6 billion by 2050, the equivalent of almost **three planets** will be required to sustain current lifestyles

What are some of the current consumption and production patterns that need to change?

There are many aspects of consumption that with simple changes can have a big impact on society as a whole. For example, each year about one third of all food produced—equivalent to 1.3 billion tonnes worth around \$1 trillion—ends up rotting in the bins of consumers and retailers, or spoiling due to poor transportation and harvesting practices, something that businesses need to address.

When it comes to consumers, households consume 29 per cent of global energy and contribute to 21 per cent of resultant CO2 emissions. However, if people worldwide switched to energy efficient lightbulbs the world would save US\$120 billion annually. Water pollution is also a pressing issue that needs a sustainable solution. We are polluting water faster than nature can recycle and purify water in rivers and lakes.

How can I help as a business?

It's in businesses' interest to find new solutions that enable sustainable consumption and production patterns. A better understanding of environmental and social impacts of products and services is needed, both of product life cycles and how these are affected by use within lifestyles. Identifying "hot spots" within the value chain where interventions have the greatest potential to improve the environmental and social impact of the system as a whole is a crucial first step. Businesses can also use their innovative power to design solutions that can both enable and inspire individuals to lead more sustainable lifestyles, reducing impacts and improving well-being.

How can I help as a consumer?

There are two main ways to help: **1.** Reducing your waste and **2.** Being thoughtful about what

you buy and choosing a sustainable option whenever possible.

Reducing our waste can be done in many ways, from ensuring you don't throw away food to reducing your consumption of plastic—one of the main pollutants of the ocean. Carrying a reusable bag, refusing to use plastic straws, and recycling plastic bottles are good ways to do your part every day. Making informed purchases about what we're buying also helps. For example, the textile industry today is the second largest polluter of clean water after agriculture, and many fashion companies exploit textile workers in the developing world. If you can buy from sustainable and local sources you can make a difference as well as exercising pressure on businesses to adopt sustainable practices.

For more suggestions on what you can do please visit:

<http://www.un.org/sustainabledevelopment/takeaction>



SUSTAINABLE DEVELOPMENT GOALS



13 CLIMATE ACTION



CLIMATE ACTION: WHY IT MATTERS

What's the goal here?

Taking urgent action to tackle climate change and its impacts.

Why?

Climate change is caused by human activities and is threatening the way we live and the future of our planet. By addressing climate change, we can build a sustainable world for everyone. But we need to act now.

Are people's lives really being affected by climate change?

Yes. Severe weather and rising sea levels are affecting people and their property in developed and developing countries. From a small farmer in the Philippines to a businessman in London, climate change is affecting everyone, especially the poor and vulnerable, as well as marginalized groups like women, children, and the elderly.

The Paris Agreement has helped open up nearly **US\$23 trillion** in business opportunities in emerging markets for climate-smart investments

What happens if we don't take action?

What happens if we don't take action? If left unchecked, climate change will cause average global temperatures to increase beyond 3°C, and will adversely affect every ecosystem. Already, we are seeing how climate change can exacerbate storms and disasters, and threats such as food and water scarcity, which can lead to conflict.

Doing nothing will end up costing us a lot more than if we take action now. We have an opportunity to take actions that will lead to more jobs, great prosperity, and better lives for all while reducing greenhouse gas emissions and building climate resilience.

Can we solve this problem or is it too late to act?

We can definitely address climate change, but we have to vastly increase our efforts. Much is happening around the world – investments in renewable energy have soared. But so much more needs to be done. The world must transform its energy, industry, transport, food, agriculture and forestry

systems to ensure that we can limit global temperature rise to well below 2°C, maybe even 1.5°C.

In December 2015, the world took a significant first step by adopting the Paris Agreement, in which all countries committed to take action to address climate change. Many businesses and investors are also committing themselves to lower their emissions, not just because it is the right thing to do, but because it makes economic and business sense as well.

How much would it cost to solve this problem?

In total, public and private sector investment in clean energy needs to reach at least US\$1 trillion per year by 2030, and more to build climate resilience. This sounds like a lot, but consider that of the US\$1.7 trillion invested in the global energy supply in 2016, nearly 70% was related to fossil fuels.

But more and more, governments and businesses are finding that investments

in renewable energy and sustainability are paying off.

What's more is that the estimated costs of mitigation do not account for the benefits of reduced climate change. These include cleaner air, greater food security, more liveable cities, and better health. Investments of only \$6 billion for disaster risk reduction over the next 15 years would result in total benefits of \$360 billion in terms of avoided losses over the lifetime of the investment. By acting now, we save lives, money, and avoid setbacks in the progress we have achieved to date.

What can I do to help achieve this goal?

There are many things that each of us can do as individuals. To find out what you can do, go to:

<http://www.un.org/sustainabledevelopment/takeaction/>

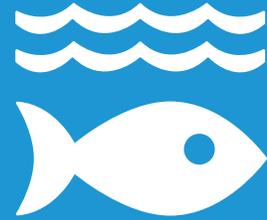
To read more about the UN's efforts on climate change:

un.org/climatechange





14 LIFE
BELOW WATER



LIFE BELOW WATER: WHY IT MATTERS

What's the goal here?

To conserve and sustainably use the world's oceans, seas and marine resources.

Why?

Oceans provide key natural resources including food, medicines, biofuels and other products. They help with the breakdown and removal of waste and pollution, and their coastal ecosystems act as buffers to reduce damage from storms. Maintaining healthy oceans supports climate change mitigation and adaptation efforts. And have you been to the sea-side? It's also a great place for tourism and recreation.

Even more, Marine Protected Areas contribute to poverty reduction by increasing fish catches and income, and improving health. They also help improve gender equality, as women do much of the work at small-scale fisheries.

The marine environment is also home to a stunning variety of beautiful creatures, ranging from single-celled organisms to the biggest animal ever to have lived on the Earth—the blue whale. They are also home to coral reefs, one of the most diverse ecosystems on the planet.

Over
3 billion
people depend
on marine
and coastal
biodiversity for
their livelihood

Sounds like a worthwhile thing to protect. So what's the problem?

Increasing levels of debris in the world's oceans are having a major environmental and economic impact. Marine debris impacts biodiversity through entanglement or ingestion of debris items by organisms, which can kill them or make it impossible for them to reproduce.

As far as the world's coral reefs are concerned, about 20 per cent of them have been effectively destroyed and show no prospects for recovery. About 24 per cent of the remaining reefs are under imminent risk of collapse through human pressures, and a further 26 per cent are under a longer-term threat of collapse.

Furthermore, improper marine management results in overfishing. The lost economic benefits from the fisheries sector are estimated to be around US\$50 billion annually. The UN Environment Programme estimates the cumulative economic impact of poor ocean management practices is at least US\$200 billion per year. In the

absence of mitigation measures, climate change will increase the cost of damage to the ocean by an additional US\$322 billion per year by 2050.

What would it cost to correct this?

The costs of taking action largely are offset by the long-term gains. In economic terms, the Convention on Biological Diversity suggests that scaled up actions to sustain the global ocean require a US\$32 billion one-time public cost and US\$21 billion dollars a year for recurring costs.

So what can we do?

For open ocean and deep sea areas, sustainability can be achieved only through increased international cooperation to protect vulnerable habitats. Establishing comprehensive, effective and equitably managed systems of government-protected areas should be pursued to conserve biodiversity and ensure

a sustainable future for the fishing industry.

On a local level, we should make ocean-friendly choices when buying products or eating food derived from oceans and consume only what we need. Selecting certified products is a good place to start.

Making small changes in our daily lives, like taking public transport and unplugging electronics saves energy. These actions reduce our carbon footprint, a factor that contributes to rising sea levels.

We should eliminate plastic usage as much as possible and organize beach clean-ups.

Most importantly, we can spread the message about how important marine life is and why we need to protect it.

To find out more about Goal #14 and other Sustainable Development Goals visit:

<http://www.un.org/sustainabledevelopment>



SUSTAINABLE DEVELOPMENT GOALS



15 LIFE
ON LAND



LIFE ON LAND: WHY IT MATTERS

What's the goal here?

To sustainably manage forests, combat desertification, halt and reverse land degradation, and halt biodiversity loss.

Why?

Forests cover nearly 31 per cent of our planet's land area. From the air we breathe, to the water we drink, to the food we eat—forests sustain us.

Think about it. Around 1.6 billion people depend on

forests for their livelihood. Almost 75 per cent of the world's poor are affected directly by land degradation. Did you know that forests are home to more than 80 per cent of all terrestrial species of animals, plants and insects? And of the 8,300 animal breeds known, 8 per cent are extinct and 22 per cent are at risk of extinction.

Biodiversity and the ecosystem services it underpins can also be the basis for climate change

Around
1.6 billion
people depend
on **forests**
for their
livelihood,
including
70 million
indigenous
people

adaptation and disaster risk reduction strategies as they can deliver benefits that will increase the resilience of people to the impacts of climate change.

Forests and nature are also important for recreation and mental well-being. In many cultures, natural landscapes are closely linked to spiritual values, religious beliefs and traditional teachings.

What would it cost to correct the problem?

The UN Forum on Forests Secretariat estimates that achieving sustainable forest management on a global scale would cost US\$70-\$160 billion per year. The Convention on Biological Diversity estimates that US\$150-\$440 billion per year is required to halt the loss of biodiversity at a global level by the middle of this century.

What would it cost if we don't correct the problem?

Biodiversity delivers multiple services from local to global levels, while responses to biodiversity loss range from emotional to utilitarian. For instance, insects and other pollen-carriers are estimated

to be worth more than US\$200 billion per year to the global food economy. Three-quarters of the top-ranking global prescription drugs contain components derived from plant extracts, which would be threatened. Natural disasters caused by ecosystems disrupted by human impact and climate change already cost the world more than US\$300 billion per year. Deforestation and forest degradation results in loss of habitat for all species, a decrease in freshwater quality, an increase in soil erosion, land degradation and higher emissions of carbon into the atmosphere. In short, not taking action on forests impacts both the health of the planet and our communities.

What can we do?

Inevitably, we change the ecosystems we are a part of through our presence—but we can make choices that either affirm diversity or devalue it.

Some things we can do to help include recycling, eating a locally-based diet that is sustainably sourced, consuming only what we need, and limiting energy usage through efficient heating and cooling systems.

We must also be respectful toward wildlife and only take part in ecotourism opportunities that are responsibly and ethically run in order to prevent wildlife disturbance.

Well-managed protected areas support healthy ecosystems, which in turn keep people healthy. It is therefore critical to secure the involvement of the local communities in the development and management of these protected areas.

To find out more about Goal #15 and the other Sustainable Development Goals, visit:

<http://www.un.org/sustainabledevelopment>



16 PEACE, JUSTICE AND STRONG INSTITUTIONS



PEACE, JUSTICE, AND STRONG INSTITUTIONS: WHY THEY MATTER

What's the goal here?

Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.

Why?

Peaceful, just and inclusive societies are necessary to achieve the Sustainable Development Goals (SDGs). People everywhere need to be free of fear from all forms of violence

and feel safe as they go about their lives whatever their ethnicity, faith or sexual orientation.

In order to advance the SDGs we need effective and inclusive public institutions that can deliver quality education and healthcare, fair economic policies and inclusive environmental protection.

What needs to be done to address this?

To achieve peace, justice and inclusion,

Peaceful, just and inclusive societies are necessary to achieve the Sustainable Development Goals.

it is important that governments, civil society and communities work together to implement lasting solutions to reduce violence, deliver justice, combat corruption and ensure inclusive participation at all times.

Freedom to express views, in private and in public, must be guaranteed.

People must be able to contribute to decisions that affect their lives.

Laws and policies must be applied without any form of discrimination. Disputes need to be resolved through functioning political and justice systems.

National and local institutions must be accountable and need to be in place to deliver basic services to families and communities equitably and without the need for bribes.

How does this goal apply to me, wherever I live?

Crimes that threaten the foundation of peaceful societies, including homicides, trafficking and other organized crimes, as well as discriminatory laws or practices, affect all countries. Even the world's greatest democracies face major challenges in addressing corruption, crime and

human rights violations for everyone at home.

What would be the cost of not taking action now?

Armed violence and insecurity have a destructive impact on a country's development, affecting economic growth and often resulting in long-standing grievances among communities.

Violence, in all its forms, has a pervasive impact on societies. Violence affects children's health, development and well-being, and their ability to thrive. It causes trauma and weakens social inclusion.

Lack of access to justice means that conflicts remain unresolved and people cannot obtain protection and redress. Institutions that do not function according to legitimate laws are prone to arbitrariness and abuse of power, and less capable of delivering public services to everyone.

To exclude and to discriminate not only violates human rights, but also causes resentment

and animosity, and could give rise to violence.

What can we do?

Take a genuine interest in what your government is doing. Raise awareness in your community about the realities of violence and the importance of peaceful and just societies, and identify how you can pursue the SDGs in your daily life.

Exercise your right to hold your elected officials to account. Exercise your right to freedom of information and share your opinion with your elected representatives.

Be the change – promote inclusion and respect towards people of different backgrounds, ethnic origins, religions, gender, sexual orientations or different opinions. Together, we can help to improve conditions for a life of dignity for all.

To find out more about Goal #16 and other Sustainable Development Goals, visit:

<http://www.un.org/sustainabledevelopment>



17 PARTNERSHIPS FOR THE GOALS



PARTNERSHIPS: WHY THEY MATTER

What's the goal here?

To revitalize the global partnership for sustainable development

Why?

In 2015, world leaders adopted the 2030 Agenda for Sustainable Development that aims to end poverty, tackle inequalities and combat climate change. We need everyone to come together—governments, civil society, scientists, academia and

the private sector— to achieve the sustainable development goals.

Why does this matter to me?

We are all in this together. The Agenda, with its 17 Sustainable Development Goals, is universal and calls for action by all countries, both developed countries and developing countries, to ensure no one is left behind.

Greater effort
is needed
to align
development
cooperation
with country-
defined
development
priorities
and results,
particularly
in fragile
countries

As partners, what would we need to do to achieve the Agenda?

We will need to mobilize both existing and additional resources—technology development, financial resources, capacity building— and developed countries will need to fulfill their official development assistance commitments. Multistakeholder partnerships will be crucial to leverage the inter-linkages between the Sustainable Development Goals to enhance their effectiveness and impact and accelerate progress in achieving the Goals.

How can we ensure the resources needed are effectively mobilized and monitored?

This will be primarily the responsibility of countries. Reviews of progress will need to be undertaken regularly in each country, involving civil society, business and representatives of various interest groups. At the regional level, countries will share

experiences and tackle common issues, while on an annual basis, at the United Nations, the High-Level Political Forum on Sustainable Development (HLPF), they will take stock of progress at the global level, identifying gaps and emerging issues, and recommending corrective action.

What can we do to help?

Join/create a group in your local community that seeks to mobilize action on the implementation of the SDGs.

Encourage your governments to partner with businesses for the implementation of the SDGs.

Register your initiatives on the SDGs Partnerships Platform to inform, educate, network, and be inspired! <https://sustainabledevelopment.un.org/partnerships>.

To find out more about Goal #17 and other Sustainable Development Goals, visit:

<http://www.un.org/sustainabledevelopment>



The Sustainable Development Goals are important, world-changing objectives that will require cooperation among governments, international organizations and world leaders. It seems impossible that the average person can make an impact. Should you just give up?

No! Change starts with you. Seriously. Every human on earth—even the most indifferent, laziest person among us—is part of the solution. Fortunately, there are some easy things we can adopt into our routines that, if we all do it, will make a big difference.

Have a look at just a few of the many things you can do to make an impact!



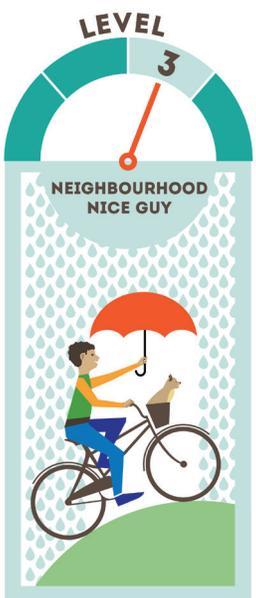
THINGS YOU CAN DO FROM YOUR COUCH

- Save electricity by plugging appliances into a power strip and turning them off completely when not in use, including your computer.
- Stop paper bank statements and pay your bills online or via mobile.
- Speak up! Ask your local and national authorities to engage in initiatives that don't harm people or the planet. You can also voice your support for the Paris Agreement and ask your country to ratify it or sign it if it hasn't yet.
- Turn off the lights. Your TV or computer screen provides a cosy glow, so turn off other lights if you don't need them.
- Do a bit of online research and buy only from companies that you know have sustainable practices and don't harm the environment.
- Report online bullies. If you notice harassment on a message board or in a chat room, flag that person.
- In addition to the above, offset your remaining carbon emissions! You can calculate your carbon footprint and purchase climate credits from Climate Neutral Now. In this way, you help reduce global emissions faster!"



THINGS YOU CAN DO FROM HOME

- Air dry. Let your hair and clothes dry naturally instead of running a machine. If you do wash your clothes, make sure the load is full.
- Take short showers. Bathtubs require gallons more water than a 5-10 minute shower.
- Eat less meat, poultry, and fish. More resources are used to provide meat than plants
- Compost—composting food scraps can reduce climate impact while also recycling nutrients.
- Recycling paper, plastic, glass & aluminium keeps landfills from growing.
- Buy minimally packaged goods.
- Plug air leaks in windows and doors to increase energy efficiency
- Adjust your thermostat, lower in winter, higher in summer
- Replace old appliances with energy efficient models and light bulbs



THINGS YOU CAN DO IN YOUR NEIGHBOURHOOD

- Shop local. Supporting neighbourhood businesses keeps people employed and helps prevent trucks from driving far distances.
- Let your favourite businesses know that ocean-friendly seafood is on your shopping list.
- Shop only for sustainable seafood. There are now many apps that will tell you what is safe to consume.
- Bike, walk or take public transport. Save the car trips for when you've got a big group.
- Use a refillable water bottle and coffee cup. Cut down on waste and maybe even save money at the coffee shop.
- Bring your own bag when you shop. Pass on the plastic bag and start carrying your own reusable totes.
- Take fewer napkins. You don't need a handful of napkins to eat your take-out. Take just what you need.
- Shop vintage. Brand-new isn't necessarily best. See what you can repurpose from second-hand shops.
- Donate what you don't use. Local charities will give your gently used clothes, books and furniture a new life.
- Take advantage of your right to elect the leaders in your country and local community



THINGS YOU COULD DO AT WORK

- Give fruits or snacks that you don't want to someone who needs and is asking for help.
- Does everyone at work have access to healthcare? Find out what your rights are to work. Fight against inequality.
- Mentor young people. It's a thoughtful, inspiring and a powerful way to guide someone towards a better future.
- Voice your support for equal pay for equal work.
- Lend your voice to talk about the lack of toilets in many communities around the world!
- Make sure your company uses energy efficient heating and cooling technology.
- Raise your voice against any type of discrimination in your office. Everyone is equal regardless of their gender, race, sexual orientation, social background and physical abilities.
- Bike, walk or take public transport to work. Save the car trips for when you've got a big group.
- Organize a No Impact Week at work. Learn to live more sustainably for at least a week: un.org/sustainabledevelopment/be-the-change.