Module 5 - SUSTAINABLE DEVELOPMENT AND SUSTAINABILITY

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Time Frame: 17 hours

Introduction

In Module 1, you learned about the Principle of Sustainable Development. You learned about the spheres of the Earth in Module 2, and how these are affected by the many and varied environmental problems we face today as discussed in Module 3. Although environmental ethics and worldviews vary (as your learned in Module 4), we all still need to work as one, since we live in one world, where everything is interconnected.

Our environment is our most important asset. The government is working with the community to secure the sustainable use of our natural resources. The future of our beautiful region starts with protecting and caring for it today.

So… let's wrap this course up! Congratulations for reaching this last module! What we learned in this course will hopefully not end in our heads, but translate into actions that will transform our world, one step at a time.

Objectives:

At the end of this lesson, the students should be able to:

- **Explain** the concepts of sustainable development and sustainability;
- **Describe** how humans work together to help solve environmental problems; and
- **Propose** solutions to environmental problems related to the students' field study

Pre-test. Write the letter of your answer to the following:

For question numbers 1 to 3, select your answer from the following choices:

a. Sustainable b. Development c. Sustainable Development

1. The process or the activity can be maintained without exhaustion or collapse.
2. Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.
3. Finding ways to satisfy and improve human needs.

For question numbers 4 to 6, select your answer from the following choices:

a. Economics b. Ecology/Environment c. Energy

4. Restore the biological base (soils, forests, atmosphere and hydrosphere).
5. Move to renewable energy sources (hydrogen, solar, wind, geothermal, biomass and hydroelectric).
6. Reduce wastes in production, packaging and distribution.

Learning Activities

Lead In: Top 10 Global Environmental Problems. Answer each statement as True or False.

Statement A Deforestation is the major contributor to the loss of endangered species across the planet. For example, the rate of destruction of the Amazonian rainforest increased by 40 % between 2001 and 2002. More than 25,000 sq km were cleared in a year, mainly for farming. That represents an area of land larger than Russia. **True: Go to H** **False: Go to I**	**Statement I** Meat production continues to increase. As a country, China now consumes more meat than the USA (although its consumption per person is much lower). One of the arguments for eating less or no meat is the inefficient use of resources. It takes 1,000 liters of water to produce 1kg of beef but only 500 liters for 1kg of potatoes. **True: Go to F** **False: Go to E**
Statement H “There is enough for everyone‘s need but not enough for everyone‘s greed.“ George W. Bush. **True: Go to E** **False: Go to K**	**Statement G** Irrigation allows wastage on a huge scale, with around 10 % of the water getting away or evaporating before it can do any good. **True: Go to L** **False: Go to H**
Statement L In the last 50 years we have lost 300,000 species. Species are disappearing between 100 and 1,000 times as fast as they were before humans arrived. **True: Go to B** **False: Go to K**	**Statement D** Fossil fuels still provide almost 80% of the world‘s total energy needs and more than six billion tons of carbon emissions are produced annually from burning fossil fuel. **True: Go to F** **False: Go to B**
Statement F By the year 2032, more than 70 % of the Earth‘s land surface is likely to be destroyed, fragmented or disturbed by cities, roads, mines and other infrastructure of human civilization. The present level is about 50 %. **True: Go to J** **False: Go to C**	**Statement K** The Green revolution of the 1860s combined better varieties of wheat and rice with pesticides and chemical fertilizers. This brought great benefits to production in countries such as India but at extreme environmental costs. **True: Go to G** **False: Go to A**
Statement C The amount of pesticide sprayed on crops around the world has increased 26 times in the last 50 years. **True: Go to D** **False: Go to I**	**Statement E** By 2025, the number of people who do not have enough water is expected to reach 2.5 billion. **True: Go to C** **False: Go to A**
Statement J Some 50 billion people a year already have to deal with flooding caused by storm surges. If the sea rises by one meter, it will flood 1 % of Egypt‘s land, 6 % of the Netherlands and 17.5% of Bangladesh. **True: Go to D** **False: Go to L**	**Statement B** The main greenhouse gas is carbon dioxide, which is produced by burning of fossil fuels. Levels in the atmosphere have increased by a third since the industrial revolution started in the 1760s. **True: Go to G** **False: Go to J**

A. Concepts of Sustainability (World Commission on Environment and Development (1987): *Our Common Future)*

"Sustainable"

- *The process or the activity can be maintained without exhaustion or collapse.*
- *Intra- and Inter-generational issue.*
- *Capacity of a system to accommodate changes:*
  - ✓ *Rates of use of renewable resources should not exceed their rates or regeneration.*
  - ✓ *Rates of use of non-renewable resources should not exceed at which renewable substitutes are developed.*
  - ✓ *Rates of pollution emissions should not exceed the assimilative capacity of the environment.*

"Development"

- *Development is about people, not necessarily the economy.*
- *Development is a process.*
- *Improvement of the welfare of the population:*
  - ✓ *Create an enabling environment for people.*
  - ✓ *Often forgotten in the immediate concern with the accumulation of commodities and wealth.*
  - ✓ *Finding ways to satisfy and improve human needs.*

Sustainable Development:

- development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Elements of Sustainability *(World Commission on Environment and Development, 1987)*

1. Environment

- *biodiversity*
- *materials*
- *energy*
- *biophysical interactions*

2. Economy

- *money and capital*
- *employment*
- *technological growth*
- *investment*
- *market forces*

3. Society

- *human diversity (cultural, linguistic, ethnic)*
- *equity (dependence / independence)*
- *quality of life*
- *institutional structures and organization*
- *political structures*

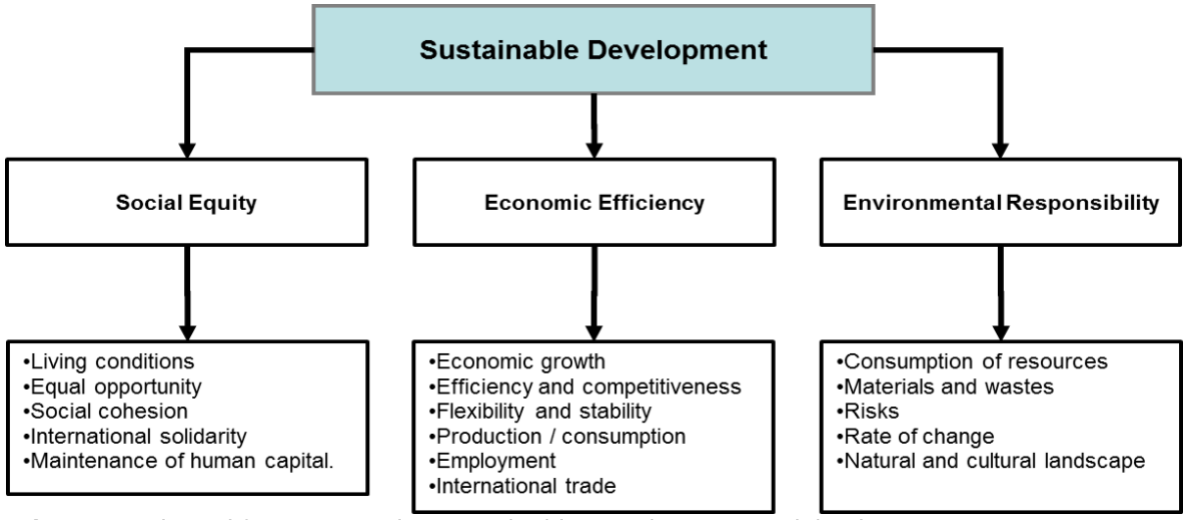

Figure 1. Adapted from: Measuring Sustainable Development, Insights into MONET

Google Classroom

Think-and-share. In Google Classroom (see "Classwork"), comment on this question: **Is driving to school a sustainable activity? Explain your position.** *As you consider this question, think about the impact of driving to school on the environment, the economy, and society* (Table 1)*:*

Table 1. Guide to sustainability of an activity.

Environment	Economy	Society
• What resources are used? • Are the resources used able to be renewed or regenerated? • Are plants and/or animals damaged?	• What is the economic impact of this activity? • Does the activity create meaningful and satisfying work for individuals? • Does the activity allow people to do their jobs more efficiently?	• Does the activity contribute to people's quality of life? • Do some people benefit from this activity at the expense of others? • Does the activity affect people's cultures?

B. Multilateral Environmental Agreements *(MEAs)*

What are MEAs?

Many global environmental issues don't stop at the border:

- they are caused by sources thousands of kilometers away;
- they can have a regional or even a global impact.

MEAs are *international legal instruments* that:

- have a goal of environmental protection (sustainable development);
- take measures to remedy, mitigate or otherwise deal with global and/or regional environmental concerns;
- are concluded between a large number of states or international organizations as Parties;
- can be embodied in a single instrument or more related instruments;
- are governed by international law;
- are concluded in written form.

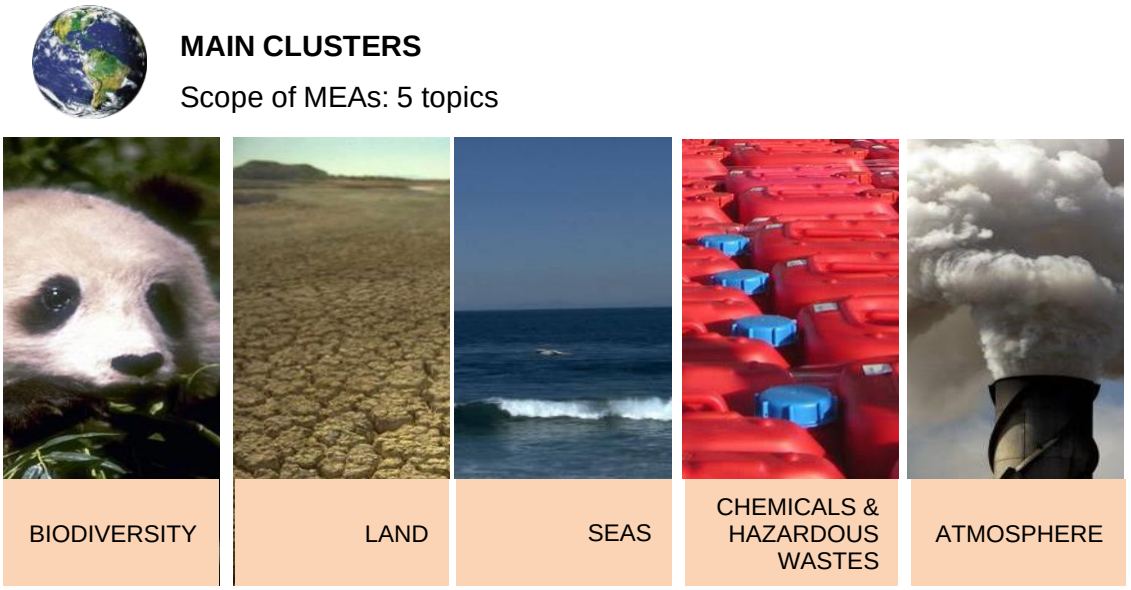

Figure 2. Scope of multilateral environmental agreements (MEAs). Image source: www.unep.org

MEAs related to protection and conservation of **BIODIVERSITY**.

- Convention on Biological Diversity (CBD);
- Others include CITES, CMS, Ramsar Convention on Wetlands etc.

MEAs focusing on protecting **LAND** from "negative altering".

- UN Convention to Combat Desertification (UNCCD);
- 3 Rio Conventions linked to climate change and biodiversity.

MEAs relevant to the **REGIONAL SEAS & MARINE ENVIRONMENT**.

- 17 Regional Seas Conventions;
- Global Program of Action for the protection of the marine environment from land-based activities (GPA).

MEAs aimed at protection of the **ATMOSPHERE** from pollutants.

- Montreal Protocol on substances that deplete the ozone layer;
- UNFCCC (UN Framework Convention on Climate Change) and the linked Kyoto Protocol.

MEAs dealing with hazardous **WASTES & CHEMICAL** pollution.

- Basel Convention on the control of transboundary movement of hazardous wastes and their disposal;
- Rotterdam Convention on the prior informed consent for certain hazardous chemicals and pesticides in international trade;
- Stockholm Convention on Persistent Organic Pollutants (POPs).

Environmental Milestones:

UN Conference on the Human Environment (Stockholm, Sweden; 1972)

UN World Conference on Environment and Development (UNWCED, 1987)

- Sustainable Development defined in "Our Common Future" (Brundtland Report)

UN Conference on Environment & Development (UNCED) / Earth Summit (Rio de Janeiro; 1992)

- Agenda 21
- Philippine Agenda 21

World Summit on Sustainable Development (Johannesburg, South Africa; 2002)

- Enhanced Philippine Agenda 21

Millennium Development Goals (MDGs) (2000-2015)

Sustainable Development Goals (SDGs) (2016-2030)

Video. Watch 12-year old Severn Cullis-Suzuki speaking at the Earth Summit in Rio de Janeiro, 1992 at https://youtu.be/lhesdVrawgc. After watching the video, answer the following:

- How did you feel after watching the video? Post a comment on social media and upload a screenshot of your post in Google Classroom! (see "Classwork")

C. Sustainable Development Goals (SDGs)

The SDGs are …

- A set of 17 goals for the world's future, through 2030
- Backed up by a set of 169 detailed Targets
- Negotiated over a two-year period at the United Nations
- Agreed to by nearly all the world's nations, on 25 Sept 2015

Read the SDGs booklet "Sustainable Development Goals" (UNDP, 2015) for a brief description of each of the 17 SDGs.

What is new and different about the 17 SDGs?

- First, and most important, these Goals apply to *every* nation … and every sector. Cities, businesses, schools, organizations, *all* are challenged to act. This is called **Universality**.
- Second, it is recognized that the Goals are all inter-connected, in a system. We cannot aim to achieve just one Goal. We must achieve them all. This is called **Integration**.
- And finally, it is widely recognized that achieving these Goals involves making very big, fundamental changes in how we live on Earth. This is called **Transformation**.

Pause and Ponder: Draw a line between two goals. Can you see the connections? Explain how these two goals are connected or related to each other.

Source: United Nations. https://www.un.org/sustainabledevelopment/

Self-Evaluation.

1. Explain the concepts of sustainable development and sustainability.
2. Describe how humans work together to help solve environmental problems.
3. Propose solutions to environmental problems related to your field of study.

Classwork. Pick one of the two activities described below. Choose either a written proposal form or oral format (video with visual aid / presentation).

1. Describe an environmental problem related to your field of study. Provide possible solutions that will address this problem in a sustainable way, explaining how this solution will address the three pillars of sustainability.
2. Propose a Campus Sustainability project for SSCT. Which SDG will it support? Who will be involved? How will it be carried out?

Review of Concepts

"Sustainable"

- *The process or the activity can be maintained without exhaustion or collapse.*

"Development"

- *Improvement of the welfare of the population:*

Sustainable Development:

- development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Sustainable Development Goals

- A set of 17 goals for the world's future, through 2030

Post-test

Your instructor will give instructions as to your post-test for this module.

References

Enger, Eldon D. and Smith, Bradley F. (2010). Environmental Science: A Study of Inter-relationships (12th ed) [E-Reader Version]. NY: McGraw Hill Higher Education.

Tyler Miller, G., & Spoolman, S. (2018). Living in the Environment. Cengage Learning.

World Commission on Environment and Development (1987): Our Common Future Sources: http://www.bbc.co.uk/sn, http://www.canadianwild.ca

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United Nations Development Programme. (2015). Sustainable Development Goals. https://www.undp.org/content/undp/en/home/librarypage/corporate/sustainable-development-goals-booklet.html

Severn Cullis- Suzuki—The Speech that Silenced the World for 5 Minutes. (2017). https://www.youtube.com/watch?v=lhesdVrawgc&feature=youtu.be

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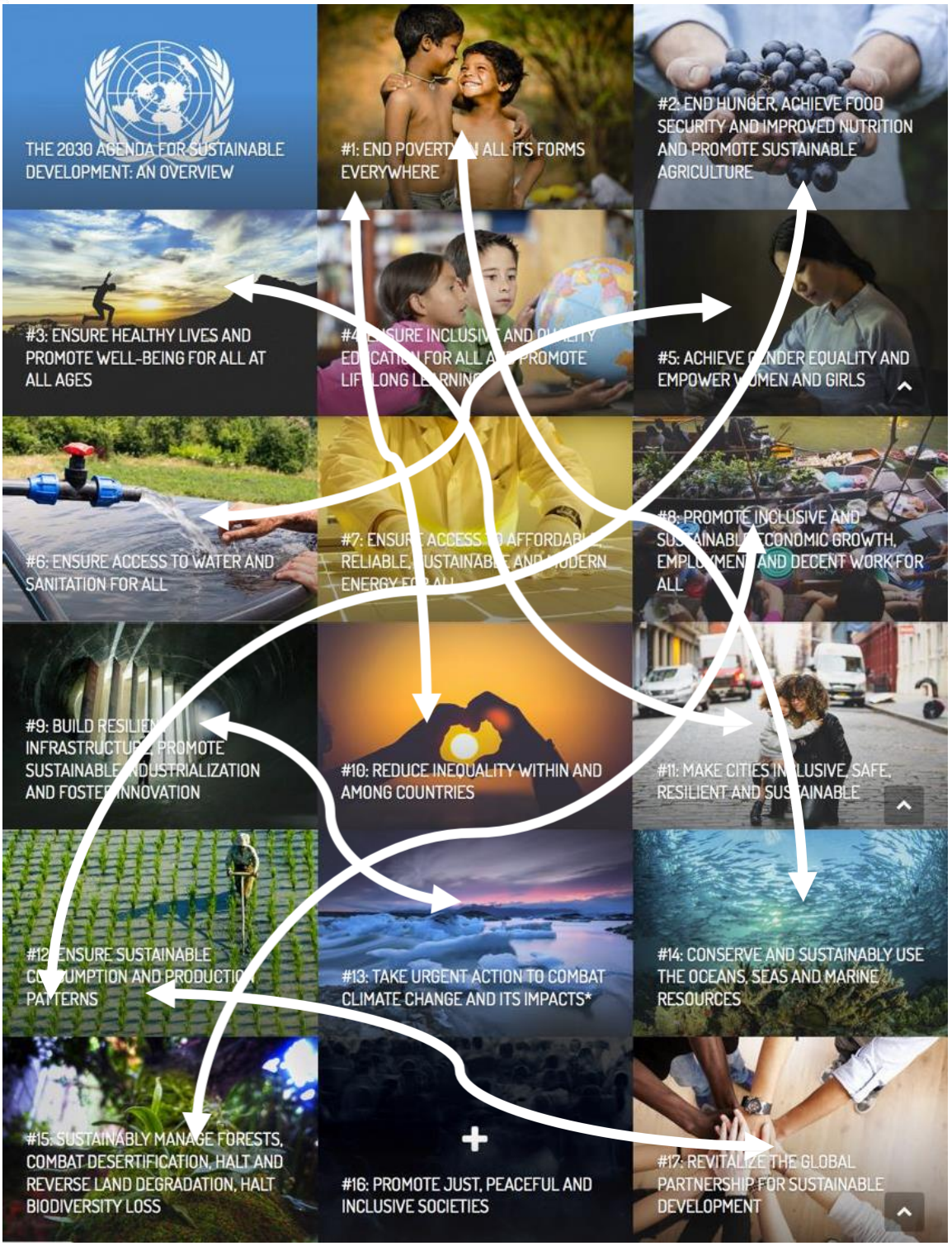
Answer key to "Lead In" on page 4:

Statement	Answer	Go to
A	**False:** 25,000 sq km does not represent an area of land larger than Russia! The area of Russia is 17,075,400 sq km. E.g. the area of Belgium is slightly more than 25,000 sq km (30,528 sq km). For comparison: The area of the Czech Republic is 78,864 sq km.	I
I	**False:** Much more water is needed to produce 1 kg of beef (about 10,000 liters)	E
E	**True**	C
C	**True**	D
D	**True**	F
F	**True**	J
J	**False**: Not 50 billion – 50 million people a year already have to deal with flooding caused by storm surges.	L
L	**True**	B
B	**True**	G
G	**False:** Much more water is lost due to inefficient irrigation methods (about 60%).	H
H	**False:** This is not a statement by George W. Bush, but by Gandhi (1869 - 1948), a major political and spiritual leader of India and the Indian independence movement.	K
K	**False:** The Green revolution does not date back to 1860s, but to 1960s.	A



Each goal is important in itself …

And they are all connected