

# **MCN-201 :**

# **SUSTAINABLE ENGINEERING**

## **MODULE 1**

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**Sustainability:** Introduction, concept, evolution of the concept; Social, environmental and economic sustainability concepts; Sustainable development, Nexus between Technology and Sustainable development; Millennium Development Goals (MDGs) and **Sustainable Development Goals (SDGs)**, **Clean Development Mechanism (CDM)**.

# *Sustainable Development Goals* (SDGs)

The goals focus on improving inequality regarding health, education, and the economy, with a large focus on helping to tackle climate change and preserve the oceans

- There are 17 sustainable development goals



# SUSTAINABLE DEVELOPMENT GOALS

17 GOALS TO TRANSFORM OUR WORLD

1 NO POVERTY



2 ZERO HUNGER



3 GOOD HEALTH AND WELL-BEING



4 QUALITY EDUCATION



5 GENDER EQUALITY



6 CLEAN WATER AND SANITATION



7 AFFORDABLE AND CLEAN ENERGY



8 DECENT WORK AND ECONOMIC GROWTH



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



10 REDUCED INEQUALITIES



11 SUSTAINABLE CITIES AND COMMUNITIES



12 RESPONSIBLE CONSUMPTION AND PRODUCTION



13 CLIMATE ACTION



14 LIFE BELOW WATER



15 LIFE ON LAND



16 PEACE, JUSTICE AND STRONG INSTITUTIONS



17 PARTNERSHIPS FOR THE GOALS



SUSTAINABLE  
DEVELOPMENT  
GOALS

## **1. No Poverty**

- End extreme poverty reduce half the population living in poverty, implement protection systems, ensure equal rights to economic resources and basic services

## **2. Zero Hunger**

- end hunger, end all forms of malnutrition, double agricultural productivity and the income of small-scale food producers.

## **3. Good Health and Well-Being**

- Reduce maternal mortality, end preventable newborn and child death, end multiple disease epidemics, reduce premature mortality

#### **4. Quality Education**

Ensure free and quality primary and secondary education, give children access to early childhood development, ensure equal access for men and women to afford higher education choices.

#### **5. Gender Equality**

End discrimination against women, eliminate all forms of violence against women, ensure access to feminine health care, and ensure equal rights.

#### **6. Clean Water and Sanitation**

Provide equal universal access to safe drinking water, sanitation, and hygiene, reduce water pollution.

## **7. Affordable and Clean Energy**

Increase renewable energy use, improve energy use efficiency, enhance international cooperation regarding clean energy access

## **8. Decent Work and Economic Growth**

Sustain economic growth, increase economic productivity, promote tourism, and grant access to financial institution access for all.

## **9. Industry, Innovation, and Infrastructure**

Reliable infrastructure for all, sustainable industrialization, increased access of small-scale industries and enterprises in developing countries, rendering industries sustainable, and improving technology in all industries.

## **10. Reduced Inequalities**

better financial market and institution regulation, legitimate institutions that represent developing countries in global decisions, and safe migration.

## **11. Sustainable Cities and Communities**

safe and affordable housing for all, safe and affordable transport for all, monitoring air quality and waste management to reduce negative city impact, and to provide green public space

## **12. Responsible Consumption and Production**

implementing a 10-year framework program for sustainable development and consumption, achieving sustainable management, encourage company sustainable practices, sustainable public procurement practices.

## **13. Climate Action**

being prepared for climate related disasters, integrating climate policies into national policies, and raising climate awareness

## **14. Life Below Water**

preventing marine pollution, protecting marine and coastal ecosystems.



## **15. Life on Land**

ensuring freshwater ecosystem health, sustainable management of forests, and integrating biodiversity values into national planning.

## **16. Peace, Justice, and Strong Institutions**

Reduce violence and death rates, end all forms of violence against children, and ensuring public access to information and freedom rights

## **17. Partnership for the Goals**

Enhance developing country international support, enhancing international cooperation, increase developing country exports, and enhance global economic stability

**Finally, The SDGs are a global effort towards a socially just and environmentally sustainable future, where no one is left behind.**

# Clean Development Mechanism (CDM)

- Clean Development Mechanism was instituted in 2001 under Kyoto Protocol.
- Came into force on 16th February 2005 after Russia and European Community ratified it.
- Major non participants USA and Australia.

## KYOTO PROTOCOL

To tackle the challenges posed by global warming and climate change, the United Nations Framework Convention on Climate Change (UNFCCC) initiated the framing of a protocol during the climate change meeting held at Kyoto, Japan in 1997.

## Objectives:

The Clean Development Mechanism (CDM) is an instrument of cooperation between developed and developing country parties **Three main objectives:**

- ★ Assist developed countries fulfill their commitments to reduce emissions
  - ★ Assist developing country parties achieve sustainable development
  - ★ Contribute to achieving stabilization of concentrations of GHGs
- Criteria for participation

## Typical Clean Development Mechanism Projects

- Energy—Renewable energy projects, such as hydropower, wind, solar, and biomass; energy efficiency measures, such as energy-savings lamps; and energy efficiency measures in industries
- Transport—Low-carbon transport, such as bus rapid transit and electric vehicles
- Urban—Methane recovery and utilization from wastewater and solid waste treatment
- Agriculture and natural resource management—Biogas and forestry

