13.3.4 University inform and support local or regional government in local climate change disaster/risk early warning and monitoring

- There are also many research projects to reduce greenhouse gas emissions to support the local and regional government in climate change risks and warning including, for example:
-
    1. Monitoring pollutants using satellites (a project funded by the Academy of Scientific Research and Technology 2021).
    2. Confronting rampant heat waves and climate change (World Bank financing 2023).
    3. Confronting severe air pollution and black cloud episodes (World Bank financing 2023-2024).

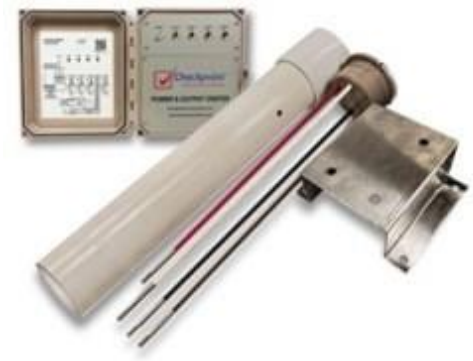
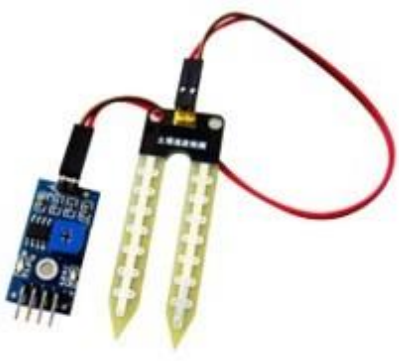
- Track the collection and recycling rates of waste. Use smart waste bins equipped with real-time tracking software to monitor waste collection.

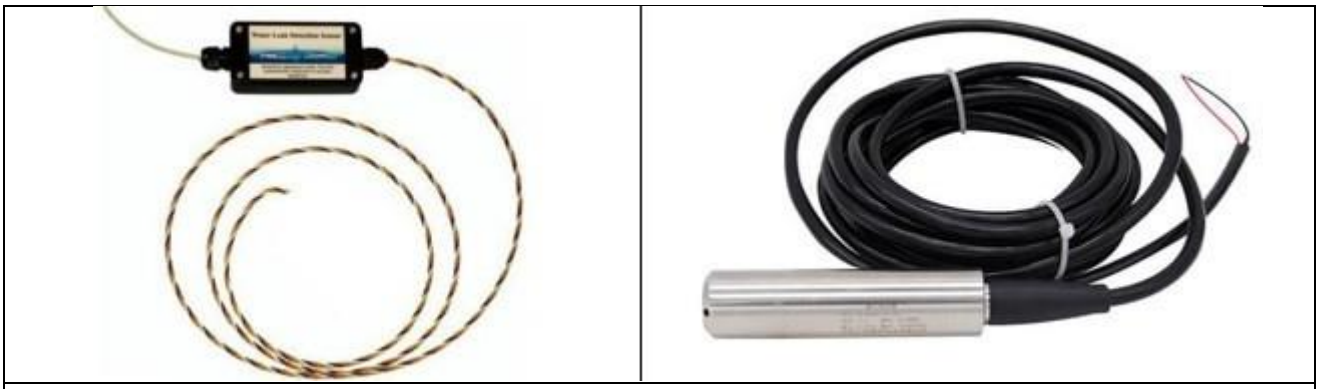
- **A sea-cleaning robot** was developed by a team of students from the Faculty of Engineering during the COP27 Climate Summit. The project involves creating an environmentally friendly vehicle that operates using electricity and solar energy, producing no emissions. Its purpose is to remove waste and oil from the seas while compiling important statistics on the impact of climate change on marine life and the environment, including coral reefs and fish. This project aims to protect the environment from waste by focusing on cleaning ports and coasts polluted by various types of waste, especially plastic, to preserve marine ecosystems. Additionally, the robot is designed to dive underwater. Many companies were interested in sponsoring this project and expanding it to benefit Egypt and the world. This initiative reflects the growing awareness among students.

1) Apply Rainwater Harvesting Systems by installing ICT-based sensors in rainwater collection tanks to monitor water levels and usage in real-time. This data will help optimize the use of harvested rainwater for campus needs such as irrigation, toilet flushing, and cleaning.

2) Implement Smart Water Monitoring Systems in campus gardens using IoT sensors to track water usage and detect leaks.

3) Utilize Soil Moisture Sensors by employing ICT-based sensors to measure soil moisture content, ensuring efficient irrigation practices, especially in the botanic garden of Faculty of Science.

	
Rainwater collection tank sensors	**Soil Moisture Sensors**



Smart Water Monitoring Systems

- **Environmental health research, analysis and studies Unit (EHRAS Unit) – High Institute of Public Health**

  Objectives:

  - Study and evaluate environmental problems, provide appropriate solutions to them, and help the university carryout its mission in the field of the environment.
  - Providing services and high-tech laboratory analyzes to faculty members and graduate students at the Institute, other colleges and institutes at Alexandria University, other universities and various bodies.
  - Training technical personnel working in the field of chemical and biological analyzes in ministries and various production and service sectors in Egypt and Arab countries.
  - Cooperating with various companies in Alexandria Governorate to monitor the quality of production to ensure the quality of the Egyptian product and its compliance with Egyptian standard specifications.
  - Finding solutions to environmental problems facing society, such as water pollution, industrial wastewater, and nutrition problems, to comply with environmental specifications, and providing technical consultations in the fieldof industry.
  - Monitoring industrial facilities and natural resources from an environmental standpoint.
  - Analysis of water samples from natural and treated sources.
  - Cooperating with universities, research centers, and international and local laboratories in research projects andquality control programs to ensure the accuracy of the results.

- **Advisory Group for Remote Sensing and Geographic Information Systems:**

  The group provides expertise in the field of satellite image analysis and the use of geographic information bases to support decision-making. It also cooperates in many areas of monitoring coastal areas, planning and follow-up, in addition to identifying appropriate sites for projects within the framework of environmental impact studies.

- **Consultative Group for Environmental Meteorology:**

  This group is concerned with monitoring coastal areas, monitoring air pollutants in industrial areas, and satellite observations. The group has created geographical information bases for environmental meteorology over a period ofsix years using the latest calibration devices. The group also integrates

with other groups to study the environmental impact of projects.

- **Air Pollution Advisory Group:**
  The group is interested in monitoring organic and inorganic gaseous emissions to determine air quality in residential and traffic-intensive industrial areas. It manages the national network of air pollutant monitoring stations in Alexandria and the Delta. It also provides consulting services to factories and agencies to determine air quality inside and outside the work environment and also control air pollutants.