

## **Climate-smart agriculture**

Crop production is vital to global food security, which is strongly affected by climate change worldwide and more severe in impoverished communities. In the next decade, climate change will be a primary cause of water and food shortages and more significant risks to health and life for billions of people living in developing countries. With fewer social, technological, and financial resources for adapting to changing conditions, developing countries are the most vulnerable to the impacts of climate change (UNFCCC, 2007). Climate-smart Agriculture is defined by the Food and Agriculture Organization (FAO) as agriculture that sustainably increases productivity, enhances the resilience of livelihoods and ecosystems, reduces and/or removes greenhouse gases (GHGs), and enhances the achievement of national food security and development goals. Climate-smart agriculture production contributes to food security by addressing different climate change impacts through adaptation and mitigation actions. The agriculture sector is among the most vulnerable to climate change impacts and is directly responsible for 14 percent of global greenhouse gas emissions. In addition, the industry is a crucial driver of deforestation and land degradation, which account for an additional 17 percent of emissions. The agricultural sector can be an essential part of the solution to climate change by capturing synergies that exist among activities to develop more productive food systems and improve natural resource management.

Climate-smart agriculture is rooted in sustainable agriculture and rural development objectives, which, if reached, would contribute to achieving the Millennium Development Goals (MDGs) of reducing hunger and improving environmental management. More productive and resilient agriculture is built on the sound management of natural resources, including land, water, soil, and biodiversity. Conservation agriculture, agroforestry, improved livestock and water management, integrated pest management, and ecosystem approaches to fisheries and aquaculture can contribute significantly to this area. Our knowledge and practices should be firmly rooted in Southeast Asia's rich culture and heritage to enable them to grow into responsible citizens through consciously practicing Climate-smart agriculture of climate change and its effects.

The Center of Excellence for Ecoinformatics, Faculty of Science, Walailak University, has over a decade of experience in sensor technology and IoT. We specialize in managing agricultural data for smart farming applications.

The program is designed to (1) strengthen the current agricultural training programs to be responsive to climate change challenges and sustainable development and (2) build a critical cadre of human resources that will promote/practice climate-smart agriculture adaptation and mitigation. The Center of Excellence for Ecoinformatics, School of Science, Walailak University, organized a practical workshop on Climate-Smart Agriculture: Smart Farming Practices, supported by the International Cooperation Division. Held from April 29 to May 17, 2024, the workshop brought together 19 participants from 19 countries, including Azerbaijan, Bhutan, China, Fiji, Indonesia, Laos, Mongolia, Nepal, Niger, Nigeria, Serbia, Uganda, Kenya, Ethiopia, Vietnam, Zambia, Zimbabwe, Panama, and Qatar. During the workshop, participants developed proposals to apply their newly acquired knowledge to implement Climate-Smart Agriculture practices in their respective countries. The primary SDG is SDG 17.2.3, which fosters international collaboration in data gathering for the SDGs. By training participants from 19 countries, the workshop facilitated collaboration in collecting data on Climate-Smart Agriculture: Smart Farming Practices, enabling adaptive management to SDG 17.4.3, and promoting education for SDGs in the broader community.

The workshop aimed to address the challenges of climate change through knowledge sharing, capacity building, and practical application.