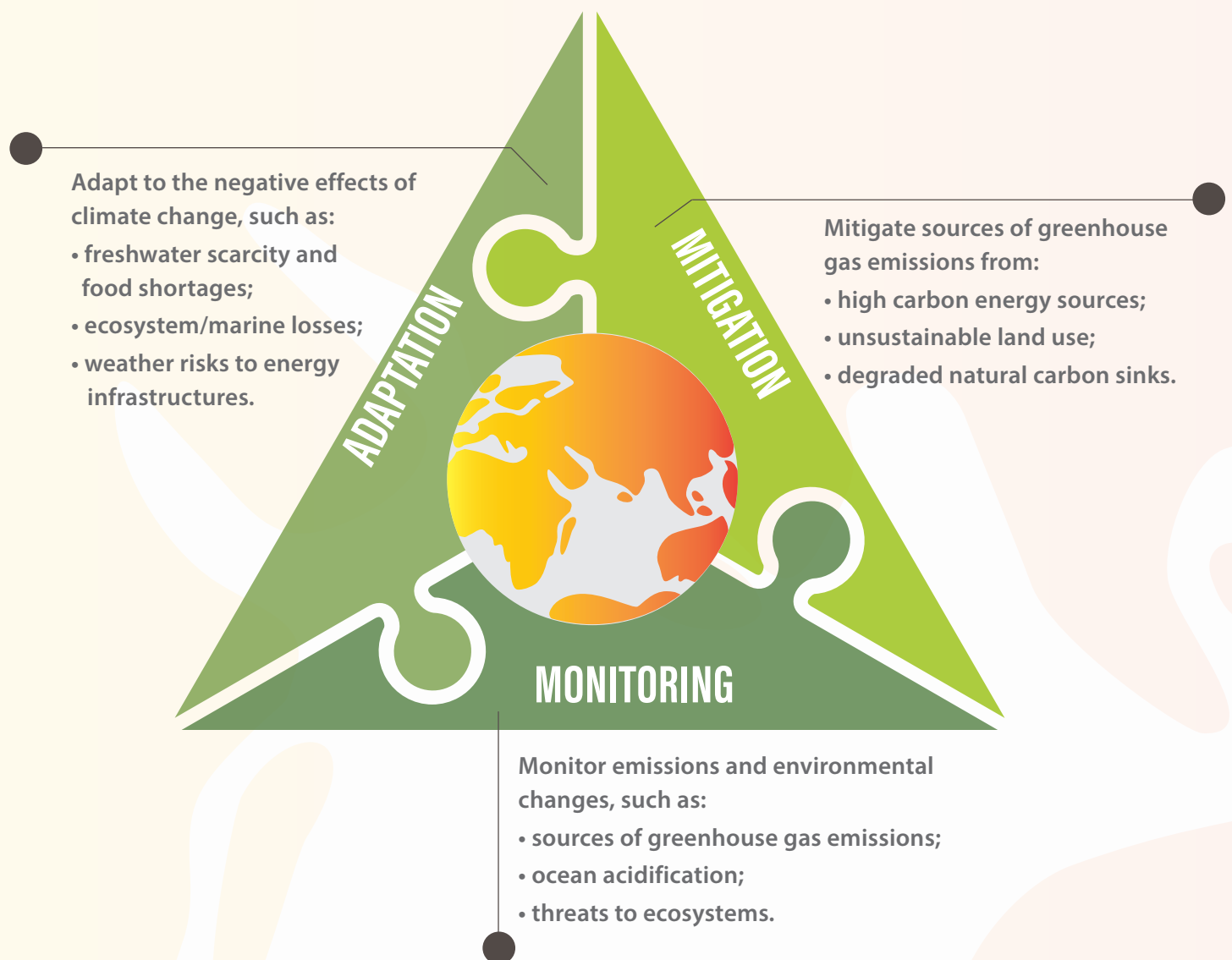


# THE IAEA AND... CLIMATE CHANGE



Climate change is one of the biggest environmental challenges affecting the planet and humanity. The IAEA helps countries use nuclear science and technology to combat climate change.





## Monitoring

Effective climate action depends on reliable data on the changes occurring on land, in oceans and throughout the atmosphere and how they connect to carbon and other greenhouse gas emissions. Scientists use nuclear and isotopic techniques to collect data for identifying, monitoring and managing sources of greenhouse gas emissions, the risks and threats to ecosystems and the evolving impact of a warming earth. This data is then shared by the IAEA to help further research and assist countries in creating, evaluating and refining policies toward a sustainable, long-term benefit.

### IAEA activities

- Assist countries to measure, monitor and research changes in ocean environments, including ocean acidification;
- Support countries to identify and monitor greenhouse gas emissions and their sources;
- Produce and share scientific information on freshwater and its origins, age, movement and quality;
- Support countries in improving accuracy of climate models and greenhouse gas measurements;
- Research the effects of a warming Earth on the climate and global changes on ecosystems;
- Collect and share data to further research and inform policymaking;
- Coordinate and support scientific research and collaboration, including technical training, fellowships, expertise sharing and equipment procurement.



**“Costa Rica aims to become carbon neutral by 2021, but the international greenhouse gas emission factors aren’t very accurate for us. The country needs more reliable data about its own emissions, and it needs to be able to gather those data itself.”**

— Ana Gabriela Pérez, Researcher,  
University of Costa Rica

## Costa Rica

has worked with the IAEA to use nuclear techniques for studying greenhouse gas emissions from the dairy and agricultural sectors and determine what actions it can take to reduce the impact of climate change. “Stable isotope analysers let us monitor agricultural processes as they happen. They allow us to quantify carbon capture and emission patterns of farming practices, enabling us to find ways to improve them,” Pérez said. This data will help inform policymaking as well as form the basis for cost–benefit calculations for moving the dairy sector toward carbon neutrality.



## Mitigation

Reigning in the effects of climate change requires tools and technology that help to reduce existing and future greenhouse gas emissions and other pollutants contributing to changes in the environment, including those from energy production. Countries can work, through IAEA support, to consider nuclear and other technology to reduce and mitigate sources of greenhouse gas emissions and increase natural carbon sinks.

### IAEA activities

- Support sustainable energy planning, including updates to nationally determined contributions under the Paris Agreement;
- Provide expertise and guidance on establishing, sustaining and expanding nuclear power programmes;
- Assist with the development of low-carbon advanced reactor and fuel technology;
- Identify new roles for nuclear power to replace high carbon sources;
- Develop tools and guidance to help countries evaluate and balance climate change priorities;
- Research ways to enlarge the role of nuclear energy in national climate change mitigation strategies;
- Develop and share methods for sustainable land use and management.

## China

has been working in part through IAEA support to develop and implement sustainable energy and climate change mitigation plans. The country's National Energy Development Strategy Action Plan set a 15% target for non-fossil energy sources by 2020, compared with just under 10% at the end of 2013. China, which alone accounts for over a third of nuclear power reactors under construction around the world, sees nuclear power as a clean source of energy that will help combat both global and local environmental problems, while contributing to the country's growing economy, Cheng said. "While for the time being still relying on fossil fuel sources, we are putting more emphasis on the development of low-carbon resources."

**"Climate change is a common challenge faced by all nations, and it is important that the international community joins together to combat this challenge. China will do its part, and nuclear energy is part of the solution."**

— Ambassador Jingye Cheng,  
China's Permanent Representative  
to the United Nations and Other  
International Organizations  
in Vienna (2011–2016)





## Adaptation

Water scarcity, food shortages, biodiversity loss and natural disasters are becoming common worldwide. To cope with these challenges, experts use nuclear science and technology to improve food security, water availability and environmental conditions. Countries can draw on IAEA guidance to preserve and restore the environment and protect energy systems, such as nuclear facilities, from climate-related weather events and disasters.

### IAEA activities

- Support sustainable management of freshwater resources and agriculture systems, including plant breeding, livestock production and insect pest control;
- Advise on and develop climate-smart agriculture methods, including for soil, crop and water management;
- Research and provide expertise on ecosystems and how to counter biodiversity loss;
- Study and provide guidance on ways to reduce the impact of climate-related severe weather on energy systems.



**“We are facing very high temperatures in winter, unpredictable weather, and the rainy seasons are becoming very short, making water scarcer. This is all because of climate change. The work we do to address climate change is made possible in large part because of the IAEA.”**

*—El Saddig Suliman Mohamed, Director General, Agricultural Research Cooperation, Sudan*

## Sudan

is using nuclear science and IAEA assistance to help more than 35 million people cope with climate change. They are, among others, breeding new plant varieties that are drought and heat tolerant; setting up and optimizing irrigation systems that save water and fertilizer as well as improve crop yields; and combatting disease-carrying insects with a nuclear-based insect pest control method called the sterile insect technique (SIT).

Produced by the Office of Public Information and Communication • Editor: Nicole Jawerth • Design and layout: Ritu Kenn

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IAEA activities in food and agriculture are performed in cooperation with the Food and Agriculture Organization of the United Nations.

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