



UK Government

UK | Middle East

Climate, Health, and Environment Resilience Programme (CHERP)

2022 - 2025



Programme Objective

To enhance regional and national climate, biodiversity and health resilience by building the capacity and information in Government and research entities required for evidence-based decision making in the marine environment.



Programme Overview

Through the Climate, Health and Environment Resilience Programme (CHERP), Cefas has been working with partner organisations across the Gulf to tackle the shared environmental challenges of climate change, biodiversity loss, enabling blue economies, and protecting human health.

It has done this by providing evidence, tools, and advice to strengthen regulation, build management capacity and develop the knowledge base to inform future management.

This wide-ranging programme included projects on One Health anti-microbial resistance, Marine Protected Area management, climate change adaptation and resilience, pollution and marine litter, biodiversity monitoring, ecosystem assessment, and blue carbon.

This programme builds on work Cefas has been delivering in the region since 2016 under the UK-Gulf Marine Environment Partnership Programme, and five decades of ongoing collaboration with Gulf States on the marine environment.

This work was funded by the UK Government through the Foreign, Commonwealth and Development Office's Gulf Strategy Fund.



This programme has provided a unique opportunity for Cefas colleagues to work with counterparts across the Gulf to tackle the shared environmental challenges of climate change, biodiversity loss and preventing pollution. By strengthening scientific collaboration we have been able to develop solutions together to these global challenges and help ensure the precious marine environment in the Gulf is managed sustainably.

Neil Hornby, Cefas CEO

Climate Change

The Middle East's marine environment is particularly vulnerable to climate change, with rising sea temperatures, ocean acidification, and extreme weather events threatening marine life and coastal communities.

Climate change impacts on the marine and coastal environment will have major social and economic consequences for all states bordering the Gulf impacting food security, water desalination, and local livelihoods.

Through research, adaptation strategies, and regional collaboration under CHERP, we can work towards mitigating these impacts and building resilience in marine ecosystems.

The outputs of this programme will support Gulf states to deliver national and regional climate targets as well as international commitments under the United Nations Framework Convention on Climate Change.



"The CEFAS led CHERP programme has been intrinsic to furthering our collaboration with Gulf States on issues including the protection of our marine environment and anti-microbial resistance. It is only through international partnerships that we will be able to overcome these global challenges."

Nick Boucher, Head of the UK Science and Technology Network (Gulf).

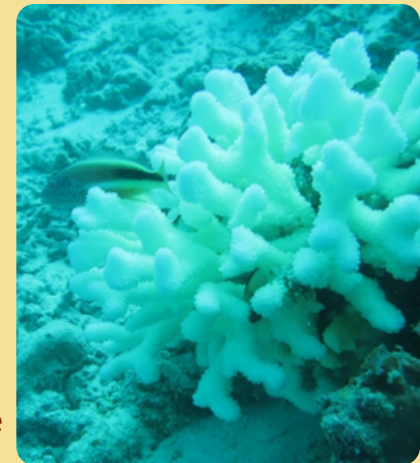


Case Study Regional Climate Change Adaptation

CHERP has been working with the Regional Organization for the Protection of the Marine Environment (ROPME) to provide advice on mitigation and adaptation options to build resilience to anticipated climate change impacts in the region.

Based on the outputs of a regional climate change risk assessment, policy briefs were produced for sectors where the greatest threats were identified. These were marine fisheries, coral reefs, and desalination plants. These included recommendations on mitigation and adaptation actions for each sector.

This work was part of the wider climate change Regional Action Plan to build coordinated regional understanding of the risks of climate change to biodiversity and society in the Arabian Gulf.



One Health Antimicrobial Resistance

The health of humans, animals, and the environment is interconnected, a concept known as the One Health approach. In marine ecosystems, antimicrobial resistance (AMR) is a growing threat, driven by pollution, wastewater discharge, and excessive antibiotic use in sectors such as agriculture and aquaculture. Resistant bacteria can spread through the water, affecting marine life and ultimately posing risks to human health.

Monitoring of AMR in marine environments is crucial to understanding its spread and developing targeted interventions. CHERP undertook research projects to investigate AMR in agricultural and marine environments and in food retail settings. This work was delivered in collaboration with the Animal and Plant Health Agency (APHA) under the UK's FAO AMR Reference Centre.

These novel research insights will help Gulf states implement their National Action Plans under the United Nations AMR Global Action Plan.



Dr Nahla Omer Eltai,
Researcher, Biomedical
Research Centre, Qatar
University.

"We are immensely grateful for the invaluable contributions of our UK partners, particularly APHA, in advancing the fight against AMR through the Campylobacter AMR project. Their expertise and dedication have been instrumental in building capacity, strengthening collaboration, and developing critical strategies to combat AMR. By embracing a One Health approach that integrates humans and animals, alongside a strong focus on food safety, this enduring partnership enhances our ability to tackle this global challenge. Together, we are paving the way for sustainable progress in public health and safer food systems."

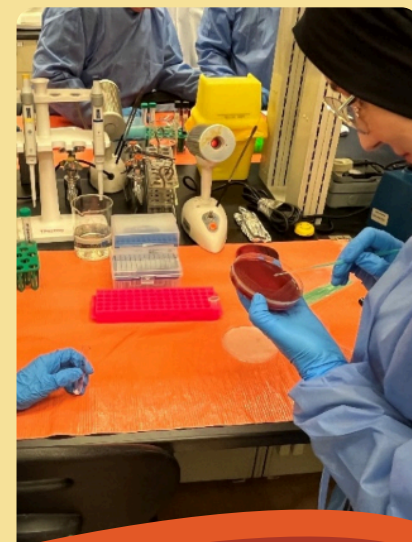


Case Study AMR Research in Kuwait

Collaborative research was conducted with the Kuwait Institute for Scientific Research (KISR) and the Environment Public Authority (EPA) to assess the presence and diversity of antibiotic-resistant genes in marine surface sediments and coastal waste-water outfalls.

This research project included training of junior researchers in bacterial isolation, identification, and AMR resistance testing, with project results published in a number of peer-reviewed scientific journal articles.

This research contributes to a baseline screening of the presence of AMR in the Gulf marine environment and will inform the ongoing development of Kuwait's agri-environment surveillance programme and national guidelines on antibiotic usage.



Key areas of collaboration under CHERP

BAHRAIN



Water quality monitoring

State of the Marine Environment Report

Climate change risk mapping

Blue carbon

Microplastics

Environmental education

UAE



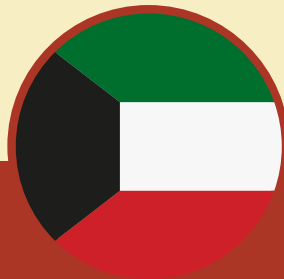
Invasive marine species management

Environmental education

COP28 outreach campaign

OneHealth AMR Consortium

KUWAIT



Marine climate change

Marine plastic pollution

Microplastics

Antimicrobial resistance

Marine monitoring & marine planning

Blue carbon

Environmental education

QATAR



MPA designation & management

Marine monitoring

Underwater video monitoring

Habitat mapping

Antimicrobial resistance

Aquaculture health assessment & risk management

Environmental education

SAUDI



Marine biodiversity Strategic Action Plan

Seagrass health & resilience

Environmental outreach

National Marine Ecosystem Assessment

State of the Marine Environment Report

Marine bioclimate modelling

Climate risk assessment

REGIONAL



Climate change Regional Action Plan

Climate change adaptation

Marine litter monitoring

Environmental education

Biodiversity

The Middle East's marine ecosystems are home to a rich diversity of life, from coral reefs and seagrass beds to endangered species like dugongs and sea turtles.

Habitat destruction, pollution, and climate change are putting immense pressure on these ecosystems. Protecting this biodiversity is important for environmental conservation as well as for social and economic benefit. Marine biodiversity supports the growing ecotourism industry in the region, protects coasts from erosion, and supports a productive fishing industry.

Effective conservation relies on robust monitoring – tracking species populations, assessing ecosystem health, and identifying threats. CHERP has been collaborating across the region on marine monitoring projects, including using advanced technologies and methods, to improve our understanding of marine ecosystems. This work supports the Global Oceans Alliance and the objective to protect 30% of the world's oceans by 2030.



HE Dr. Mohamed bin Mubarak Bin Daina, Minister of Oil and Environment, Special Envoy for Climate Affairs, Bahrain.

"The Supreme Council for Environment is dedicated to safeguarding Bahrain's marine environment. Working alongside Cefas, we are developing robust monitoring frameworks that will support evidence-based policies for the conservation of our marine habitats, and species. This collaboration reflects our unwavering commitment to environmental sustainability and responsible stewardship of our natural resources."



Case Study

Bahrain State of the Marine Environment Report

In collaboration with the Supreme Council for Environment in Bahrain, CHERP produced a State of the Marine Environment Report presenting an overview of the pressures, condition, and potential future direction of key components of Bahrain's marine environment.



This project included climate risk and resilience mapping, and identification of key pressures and marine features most and least likely to experience future declines.

A framework for future biodiversity assessment and monitoring was also developed which incorporates consideration of climate risks. This work provides a baseline for future marine status reporting to inform decision-making and support sustainable marine management.



Marine Litter

Plastic pollution is one of the greatest threats to the marine environment, with millions of tonnes of waste entering the oceans each year. Microplastics have been found in marine animals and seafood, harming marine life and potentially also having economic and human health impacts.

As a shallow, semi-enclosed sea, the Gulf is particularly vulnerable to the build-up of marine litter. Coastal development and maritime industries are expanding in the region and marine litter and microplastics are increasingly reported. However, there is limited information about its abundance, source, and impact.

Monitoring plastic waste sources and distribution patterns helps inform policies and clean-up efforts. CHERP supported a regional initiative to develop monitoring indicators and protocols for regionally harmonised marine litter sample collection, analysis, and reporting.



"We are truly grateful for the valuable contributions that Cefas has made in advancing regional efforts, particularly through initiatives like the regional marine litter project. Your expertise and dedication have been instrumental in building capacity and developing critical protocols that benefit the entire region."

Dr Mohammad Al-Ahmad, Executive Secretary, Regional Organization for the Protection of The Marine Environment.



Case Study

Assessment of Microplastics in Bahrain & Kuwait

CHERP worked with the Supreme Council for Environment in Bahrain and the Environment Public Authority in Kuwait to expand microplastic sample collection and analysis.

New laboratory capacity was established with advanced microplastic detection and identification capabilities. Sample collection and analysis training were delivered and protocols were developed to support standardised assessment of microplastics in water and sediments as part of regular marine monitoring.

This work will support the establishment of a regional baseline of microplastics data to inform future management and reporting requirements.



Environmental Education

Empowering communities with knowledge and spreading awareness on a local scale is vital to protecting the marine environment.

Environmental education fosters a deeper understanding of how human activities interact with marine ecosystems and inspires action toward sustainability. Engaging youth through outreach programmes, citizen science initiatives, and educational campaigns, can instil a sense of environmental responsibility and stewardship from a young age whilst encouraging an interest in environmental sciences.

CHERP included a cross-cutting, bilingual environmental education component focussed on local community and school engagement.

The programme worked with universities, schools and other local organisations on outreach activities as well as using digital tools such as social media, blogs, podcasts, television, and radio.



"Introducing our primary students to Cefas marine plastic scientists has been hugely beneficial to help educate the next generation. Their expertise, enthusiasm and adaptability to work alongside young children to enhance their understanding of sustainability and the environment is commendable."

Natasha Lee, Year 4 Teacher and Year Group Leader, Jumeirah English Speaking School, United Arab Emirates.

Case Study School Resource Packs

CHERP collaborated with teachers and Government agencies to develop locally-relevant resource packs to be used within schools across the region on topics including marine litter and climate change.

A multidisciplinary approach was used, integrating scientific knowledge, teaching expertise, and cultural insights. The packs contain interactive materials including infographics, worksheets, fieldtrips, and case studies, for different grade levels to ensure age-appropriate content and activities.

The project focused on providing teachers with the tools they need to educate students on the causes, impacts, and solutions to these important environmental issues. Emphasis was placed on promoting critical thinking, problem-solving, and positive behavioural change.





We are the government's marine and freshwater science experts, working for healthy and productive oceans, seas and rivers and safe and sustainable seafood. Innovative, world-class science is central to our mission. We work to safeguard human and animal health, enable food security and support marine economies.

For more information on Cefas or the UK-Middle East Climate, Health and Environment Resilience Programme (CHERP) please contact us.

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