GFA
CONSULTING GROUP

CLIMATE CHANGE

MITIGATION
ADAPTATION
CROSSCUTTING

SUPPORTING CLIMATE ACTION AROUND THE WORLD

GFA as a leading German consulting firm in international cooperation tackles climate change challenges head-on. The company's dedicated teams assist organizations in minimizing, reducing, and mitigating greenhouse gas emissions through a range of projects and activities worldwide.

GFA experts empower clients and partners to adapt to changing climate conditions brought on by global warming. The sections below highlight how GFA is contributing to the goals of the Paris Agreement.

GFA CLIMATE CHANGE SERVICES

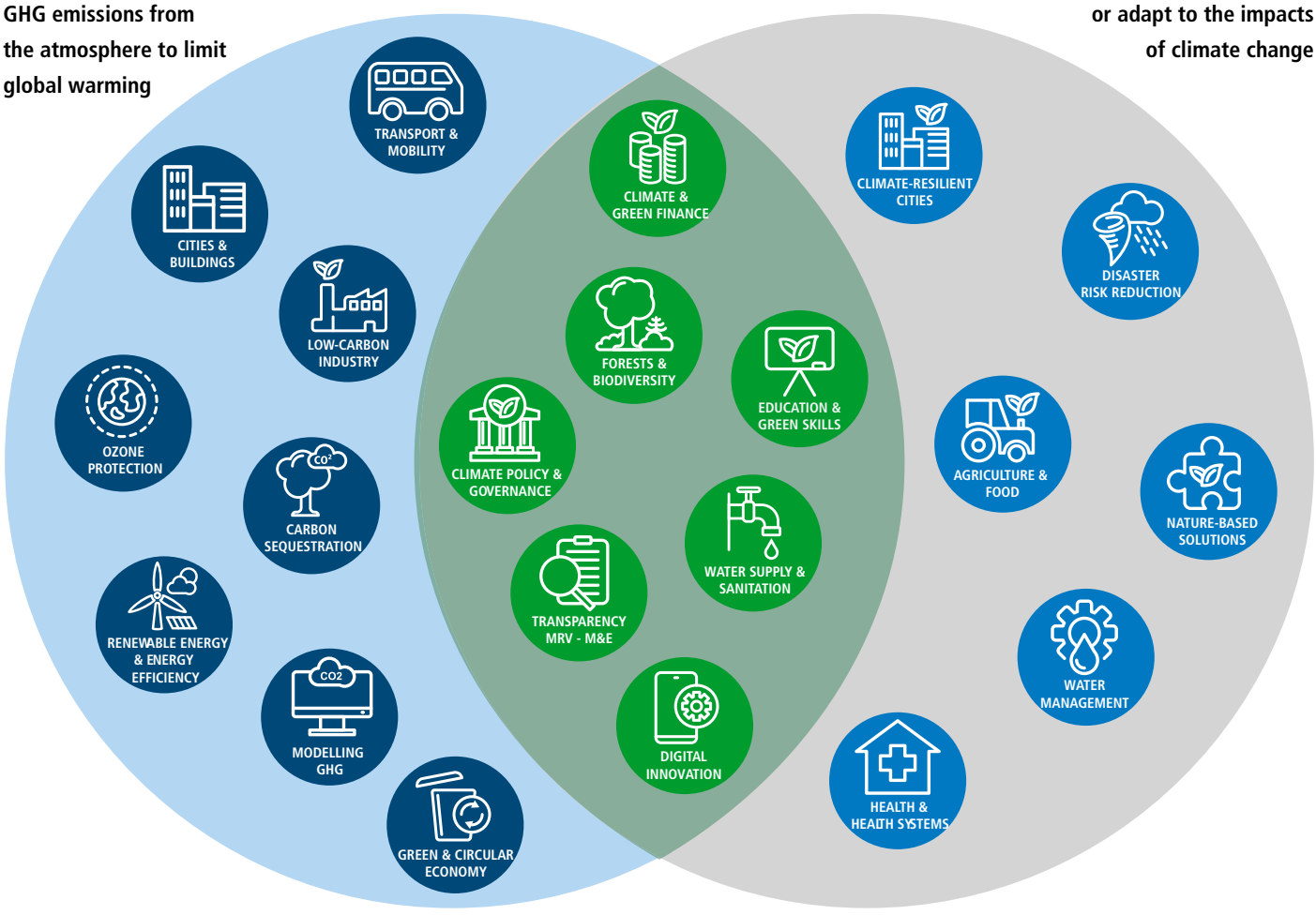
Towards a low-carbon future and climate resilience

MITIGATION

Prevent, reduce, or eliminate GHG emissions from the atmosphere to limit global warming

ADAPTATION

Reduce, compensate for, or adapt to the impacts of climate change



MITIGATION

LOW-CARBON INDUSTRY

Many countries have committed to net-zero targets in limiting global warming to 1.5°C and have pledged to focus their economic growth on climate-smart approaches. This means producing and consuming clean energy, moving to fuel-efficient transport systems, and adopting sustainable mining practices. It also means developing climate-smart agriculture and water systems.

The industrial sector is a vital source of wealth, prosperity, and social value on a global scale. Industrial companies produce about one-quarter of global GDP and employment, and they make products and materials that are integral to our daily lives. However, the industrial sector is also a major emitter of GHGs. Unless the industry can lower its emissions, the world will struggle to reach the GHG reduction targets set under the Paris Agreement.

In that respect, GFA is in a position to provide support in:

- Feasibility studies and project preparation
- Developing low-carbon sectorial strategies
- Impact assessments considering GHG emission reduction scenarios
- Promoting low-carbon farm practices in the agriculture and livestock industries
- Measures to decarbonize industrial sectors, including energy, chemical industry, cement and steel production, and the building sector

CARBON SEQUESTRATION

Carbon sequestration involves the storage of carbon dioxide to prevent its entry into the atmosphere. Plant-rich landscapes such as forests, grasslands, and rangelands capture approximately 25% of global carbon emissions. In that regard, forests play a vital role in mitigating climate change as they capture CO2 and store it in their biomass and soils.

Additionally, preventing deforestation helps maintain the stored carbon within the forests. This avoids CO2 release back into the atmosphere, which would contribute to climate change.

Apart from carbon sequestration, forests offer numerous other advantages, including the reduction of air pollution, water storage, and biodiversity protection, all of which GFA can assist by means of:

- Estimating the carbon sequestration potential from forestry and agroforestry activities
- Identifying baseline scenarios
- Developing biomass supply assessments
- Promoting minimum or no tillage farm practices in agriculture

CITIES & BUILDINGS

The construction sector is growing rapidly. It is estimated that 230 billion square meters of new infrastructure will be built worldwide over the next 40 years. This sector is a major source of pollution as it consumes 36% of global energy and produces 39% of carbon dioxide (CO2) emissions.

Mitigating climate change requires reducing GHG emissions. One way to do this is to decarbonize the built environment so hat emissions from existing buildings, new construction, and other infrastructure will be reduced and ultimately eliminated.

Mitigation strategies for climate change in buildings focus on promoting energy saving, using renewable energy, managing waste properly, integrating vegetation into building projects, and incorporating elements that facilitate non-motorized transport.

GFA can support such activities and strategies through:

- Climate proofing and environmental impact assessments development
- Capacity building for renewable energy and energy efficiency investments in cities
- Institutional and financial feasibility studies
- Pilot projects regarding the transition to low-carbon energy grids
- Measures to decarbonize the building sector

RENEWABLE ENERGIES & ENERGY EFFICIENCY

GHG emissions linked to the delivery of energy services significantly contribute to climate change. Currently, approximately 85% of the primary energy driving global economies is derived from burning fossil fuels, which is responsible for 56.6% of all human-caused GHG emissions.

In the pursuit of sustainable social and economic development, it is crucial to have reliable and affordable access to energy resources, particularly renewable ones, which can help mitigate climate change. To achieve this, different strategies may be required at various stages of economic development. The provision of energy services should prioritize minimal environmental impacts and GHG emissions reduction.

OZONE PROTECTION

The depletion of the ozone layer and the issue of climate change are two environmental concerns that are closely related on a global scale. The Montreal Protocol has successfully phased out the production and use of ozone-depleting substances (ODSs), which has contributed to the mitigation of climate change. ODSs are also greenhouse gases, and the reduction of their use has led to a decrease in the amount of heat-trapping gases in the atmosphere. Moreover, it is anticipated that the recovery of the ozone layer will help reduce global warming by up to 0.5 degrees Celsius by the year 2100.

HEAT, a member of the GFA group, has been actively involved in the implementation of the Montreal Protocol.

The company's main services have been:

- Policy advisory services in ozone protection
- Development of guidelines and roadmaps to phase out halogenated hydrocarbons (HCFC) and phase down hydrofluorocarbon (HFC) refrigerants in developing and developed countries
- Capacity building to catalyze local action in partner countries on safe technologies and management of natural refrigerants
- Support in the implementation of HCFC Phase-Out-Management Plans (HPMPs) and Kigali HFC Implementation Plans
- Feasibility duties for the use and expansion of natural refrigerants, for instance in the refrigeration and, air conditioning (RAC) sector

GFA can contribute to related measures through:

- Renewable energies market development
- Identification of opportunities for green hydrogen production
- Skills development and decentralization of capacities related to clean energies
- Energy policy framework strengthening
- Advice on construction designs for microgrids and individual solutions
- Energy-efficient and environmentally friendly construction of public and private buildings
- Feasibility studies for greener and more efficient energy alternatives

GREEN & CIRCULAR ECONOMY

Currently, material extraction and use are major contributors to global GHG emissions. Studies show that circular economy strategies can help reduce these emissions by 40% by 2050. Implementing circular economy strategies is crucial for countries to expedite the shift to a low-carbon economy, safeguard the natural environment, and generate meaningful job opportunities. This transition will require adequate investment and finance as well as knowledge transfer, community-building, and training.

In this context, GFA is working with countries to scale and accelerate this transformative change by integrating circular and green economy approaches that consider climate change, sustainable energy, food and agriculture, and waste management.

By doing so, GFA aims at scaling up and accelerating such positive changes through:

- Business development service studies
- Capacity building and cross-learning
- Awareness raising measures
- Developing conceptual frameworks in green innovations
- Technical support on the origination and preparation of projects
- Promotion of compost, water reuse, and reduction of post-harvest losses
- Developing Life Cycle Assessments (LCA)

MODELLING GHG

GHG modeling is the process of using mathematical and statistical methods to estimate GHG emissions from a variety of sources. These models can help governments develop policies to reduce emissions, businesses make decisions about their operations, and scientists study the causes and effects of climate change.

These processes can be complex and challenging tasks but are essential tools for understanding and addressing climate change mitigation. As countries, sectors, and communities become more aware of the need to reduce GHG emissions, GFA supports the provision of accurate models, results, and tailored solutions as needed.

TRANSPORT & MOBILITY

The world is not on track to limit global warming to an increase of 1.5°C, one of the goals of the Paris Agreement. The transport sector, which produces a quarter of all energy-related emissions, is a major contributor to this problem. As 95% of the world's transport energy still comes from burning fossil fuels, emissions from this sector are expected to increase without a major change of direction.

New and emerging technologies such as electric vehicles or zero-carbon energy sources are critical to mitigate climate change in the transport sector. There are transport solutions that can help achieve the Sustainable Development Goals and the Paris Agreement. Such solutions vary from shifting to more sustainable modes of transportation such as walking, cycling, and public transit to investing in electric vehicles and other low-carbon transportation technologies.

GFA experts have supported such measures in the transport sector through:

- Development of national standards and tools for the mitigation of GHG emissions
- Identification of public transport infrastructure needs
- Advice to cities and municipalities worldwide regarding the preparation of climate mitigation or adaptation infrastructure projects
- Preparation of environmental and social impact assessments necessary for transport- and mobility-related project,
- Integrated urban mobility plans with a focus on clean air and emission reduction
- Formulation of measures and capacity building for the improvement of urban transport
- Preparation of feasibility studies for electric vehicle roadmaps and policies

ADAPTATION

CLIMATE-RESILIENT CITIES

In the decades ahead, climate change will have a significant impact on cities. Building resilience capacities will therefore be an essential part of future urban policies and a core objective of smart city investments. In particular, resilient, climate-sensitive, and responsive actions are needed to adapt better.

Climate-resilient cities will have double benefits as they will be healthier, safer, and more attractive to live in, while experiencing fostered economic development. GFA considers resilience an essential asset in urban planning as it demonstrates a willingness to embrace innovation and a paradigm shift towards adaptation.

GFA has supported the implementation of projects in the following fields:

- Climate risk assessment and climate-sensitive urban planning
- Assessing the impacts of climate risks on women, men, and marginalized groups
- Capacity building for local and national stakeholders
- Participatory and climate-sensitive habitat and housing development
- Climate-sensitive budgeting

NATURE-BASED SOLUTIONS

Nature-based solutions (NbS) aim to protect, sustainably manage, or restore natural ecosystems to address societal challenges. They can be used to address a wide range of challenges, including climate change, water and food security, biodiversity loss, and disaster risk reduction.

NbS offer win-win solutions that can benefit people and nature alike in a cost-effective and sustainable way while addressing many of the challenges facing our planet. Some examples of NbS include reforestation, mangrove or wetland restoration, and green infrastructure.

GFA teams of consultants is ready to provide project-related services that can facilitate the introduction of NbS such as:

- Application of IUCN's Restoration Opportunities Assessment Methodology (ROAM) framework and Global Standards for Nature-based Solutions
- Establishment of agro-silvo-fishery-systems
- Restoration and sustainable management of mangrove ecosystems
- Ecosystem rehabilitation including conservation agriculture measures

AGRICULTURE & FOOD

Changes in rainfall patterns and rising temperatures will lead to water shortages, crop failures, and the spread of diseases. This will have devastating impacts on people in developing countries, who are already vulnerable to food insecurity.

A changing climate is making it more difficult for communities to cope with food shortages, in addition to the rising cost of food. To address these challenges, it is essential to develop adaptation strategies for food systems that will help communities become more resilient to climate change.

In that respect, experienced GFA experts support:

- Improvement of policies for better land use planning and climate-smart agriculture methods
- Development of agricultural infrastructure and the promotion of agro-entrepreneurship
- Improvement of access to finance for the recovery from climate-related losses
- Strengthening of community engagement and participatory approaches to develop context-specific adaptation strategies
- Provision of access to agrometeorological, market, and agricultural advisory services
- Development of low-carbon, resilient agricultural value chains, and food systems

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WATER MANAGEMENT

Climate change is transforming the world we live in, disrupting the natural balance of water, life, and food. This exposes the weaknesses and risks of human and ecological systems. Climate hazards amplify the pressures on shared water resources, threatening the livelihoods and well-being of people across borders. To cope with such challenges, innovative solutions are needed that can enhance the efficiency, sustainability, and resilience of water management.

GFA supports related measures through:

- Feasibility studies
- Training and capacity building
- Performance and efficiency evaluations
- Stakeholder engagement
- Integrated Water Resource Management and transboundary governance

DISASTER RISK REDUCTION

Climate change is a major driver of disaster risks such as the frequency and intensity of extreme weather such as floods, droughts, and storms. These events can cause widespread damage and loss of life. Disaster risk reduction (DRR) includes measures such as building resilient infrastructure, improving early warning systems, and educating communities about disaster preparedness. Disaster Risk Reduction and climate change adaptation are closely linked. Many measures that can reduce the risk of disasters can at the same time help communities adapt to the impact of climate change.

GFA focuses on supporting:

- Institutions and communities in access to funding and policy integration of DRR
- Development of methodologies to identify risk reduction measures based on quantitative and qualitative data
- Capacity building as part of local resilience strengthening

HEALTH & HEALTH SYSTEMS

New health risks result from climate change, which also amplifies existing health problems. The changes take on different forms in different regions, e.g. natural disasters, floods, droughts, storms, or extreme heat waves. What these events have in common is that they directly or indirectly affect human health. Direct health effects can include heat stress, respiratory illnesses, injuries, or mortality, while indirect effects comprise vector-borne diseases such as malaria and dengue fever, water- or food-borne diseases, malnutrition, non-communicable diseases, and mental health.

These impacts are even more devastating if health systems are unprepared. The latter need to increase their capacity for protecting health in an unstable and changing climate and become climate resilient. This can be achieved through political commitment and effective leadership in the capacity building of health professionals and managers while safeguarding climate and health financing. Integrated environmental risk monitoring, disease surveillance, and early warning systems are as important as emergency preparedness and management as well as climate- and health-oriented research and climate-resilient and sustainable technologies and infrastructure.

In this regard, GFA experts assist clients and partners in:

- Advisory services on infectious disease prevention and customization of national prevention, awareness, and treatment programs
- Pandemic and emergency preparedness and response disease surveillance
- Strengthening systems through the One Health approach to account for the interconnectedness of human, animal, and environmental health
- Energy-efficient health infrastructure
- Training of health personnel and managers

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CROSSCUTTING

CLIMATE POLICY & GOVERNANCE

Climate governance comprises a set of guidelines, protocols, and laws that govern the formulation of climate-related policies and strategies. Its scope is global, with the ultimate goal of directing societal frameworks toward reducing GHG emissions, minimizing losses, and adapting to the risks posed by climate change.

In addition, climate policy forms the bedrock of climate governance as it aims at developing specific policies and actions to address climate change implemented at the national, regional, or local level.

This is where GFA comes in by

- strengthening capacities of institutional frameworks in climate governance,
- supporting the Technology Mechanism of the UNFCCC,
- identifying conditions to cooperate under carbon market mechanisms,
- evaluating and supporting the development and reporting of progress towards nationally determined contributions (NDCs), and long-term strategies (LTS) to reduce emissions, and enhance resilience,
- designing project concepts in line with national climate programming, and
- integrating climate mitigation and adaption into national planning and programming.

TRANSPARENCY MRV – M&E

Measurement, Reporting & Verification (MRV) and Monitoring & Evaluation (M&E) are both important in the context of climate change. While MRV involves collecting data on GHG emissions, setting targets, and reporting progress, M&E encompasses the assessment of the effectiveness of climate change interventions identifying indicators, collecting data, and analyzing results. In other words, MRV is focused on tracking progress, while M&E concentrates on assessing impact.

GFA has a proven record of support to countries in their tracking of GHG emissions and assessment of interventions, particularly through

- data collection and calculation of emission factors in strategic sectors,
- developing methodological frameworks to quantify, monitor, and verify GHG emission reductions,
- designing, setting up and aligning MRV systems to international frameworks on transparency and climate finance,
- capacity development in terms of MRV of CO2 emissions, and
- conducting project evaluations.

CLIMATE & GREEN FINANCE

In the context of international development, GFA refers to green finance as mobilizing resources to support sustainable projects in developing countries. It involves creating financial structures and providing management of funds that aim at fostering sustainable economic growth. GFA has encouraged public-private sector collaboration, capacity building, and the utilization of multilateral financing mechanisms to support countries in their climate and sustainability efforts. This will facilitate a just transition towards a net-zero future.

Climate finance is a nascent field in the international development sector. Its primary goal is to facilitate the transition to a low-carbon and climate-resilient economy while strengthening adaptation capacities to cope with the challenges posed by climate change.

Building upon experience in the financial services field, GFA can provide solutions such as

- feasibility studies on social and green credit lines for small and medium enterprises,
- advisory services to improve sustainable finance integration, climate, and gender mainstreaming,
- the enhancement of enabling conditions to access climate finance,
- readiness assessments to access resources from multilateral climate finance delivery channels,
- improvement of environmental and social management in financial institutions,
- scoping and screening of assessment of absorption capacities in the banking sector to green financing, and
- climate-sensitive budgeting and support to governments in preparing climate-related investment projects.

FOREST & BIODIVERSITY

Forests and biodiversity are pivotal in the fight against climate change. Forests act as vital carbon sinks that absorb carbon dioxide from the atmosphere and store it, thus reducing GHG concentrations. Additionally, forests regulate local climate, conserve water, and foster biodiversity, all of which support ecosystem stability and human livelihoods. Preserving biodiversity within forests and other landscapes enhances the latter's resilience and adaptability to climate change impacts such as extreme weather events, and allows for other ecosystem services to continue functioning.

Furthermore, forests play a critical role in regulating the water cycle, preventing erosion and floods, and sustaining freshwater resources. Combating deforestation and forest degradation is crucial to stop the release of stored carbon into the atmosphere.

In that regard, GFA teams support safeguarding forests and biodiversity, promoting sustainable resource use, and fostering the well-being of both ecosystems and human communities through

- educational tools and course development,
- the development of Payment for Ecosystem Services (PES) schemes,
- forest carbon inventories,
- designing Monitoring, Reporting, and Verification (MRV) systems for forestry, including emissions and activity data,
- environmental and social impact assessments and plans, and
- training and capacity development.

CLIMATE EDUCATION & GREEN SKILLS

In developing countries, the education sector's role in addressing climate change is of utmost importance due to its potential to raise a generation that is aware of and ready to act on inherent challenges. In climate education, GFA intends to raise awareness and disseminate accurate information about climate change. As related to green skills, GFA aims at building resilience by empowering individuals to cope with climate-related challenges effectively. This is achieved through training programs on sustainable practices and offering youth and professionals the skills required for green jobs.

By leading by example through sustainable practices in communities, facilitating technology transfer, and engaging in climate finance initiatives, the education sector plays a pivotal role in fostering a skilled and informed population that can contribute to climate change mitigation and adaptation.

GFA promotes climate education to flourish in developing countries through services such as

- sector or skills gap analyses,
- strengthening of practical-oriented vocational skills considering climate change,
- reskilling services for a just transition, and
- mainstreaming climate change and environmental issues in education.

DIGITAL INNOVATION

Digital innovation is crucial in addressing climate change by leveraging synergies from technology and data to develop inventive solutions and improve resource efficiency. It enables the collection and analysis of vast amounts of data to monitor climate patterns, track GHG emissions, and assess climate impacts. Advanced computing capabilities allow for sophisticated climate modeling that aid in the prediction of future trends and inform effective strategies for adaptation and mitigation.

In addition, digital solutions can help facilitate cooperation on climate change by providing a platform for sharing information, coordinating policy, and tracking progress.

GFA offers powerful tools and approaches to accelerate progress towards a more sustainable and resilient future by working in

- data-driven services such as data collection, processing, management, analysis, visualization, and sharing,
- ICT policy and strategy,
- digital skills development, and
- digital learning for sustainability.

WATER SUPPLY & SANITATION

Climate change is a major threat to water supply and sanitation as it affects the availability, quality, and distribution of water resources, and increases the risks of water-related disasters such as floods and droughts. Water supply and sanitation are also sources of greenhouse gas (GHG) emissions, mainly from energy use and wastewater treatment. Therefore, it is critical to provide support to water utilities and other stakeholders in the water supply and sanitation sector as they have a pivotal role in both mitigating and adapting to climate change.

GFA recognizes these partners in the context of climate threats, and offers the following services:

- Reduction of energy consumption and switching to renewable energy sources
- Efficiency improvement of water distribution and treatment systems
- Strengthening the resilience of water infrastructure through integrated planning, organizational development and training, and improvement of financial viability
- Hygiene and sanitation promotion, and community engagement

* Picture on page 9: "Warming stripes for 1850-2018 using the WMO annual global temperature dataset", published by climatologist Ed Hawkins; source: https://www.climate-lab-book.ac.uk/2018/2018-visualisation-update/

CLIMATE CHANGE

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