

# CLIMATE CHANGE ADAPTATION

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## Reducing vulnerability

Adapting to extreme weather events, changes in precipitation patterns and increased weather unpredictability caused by climate change, is a huge challenge. And the fact that the least developed countries are expected to suffer the most from climate change due to high dependency on natural resources and lack of funds for adaptation measures makes the challenge even bigger.

Climate change will affect all sectors in society. In NIRAS we have expertise with adaptation in relation to water supply, natural resources management, agriculture and food security, forestry, coastal zone protection, infrastructure development and planning on all levels.

To meet the challenges of climate change, national, regional, and local action plans within the affected sectors should be prepared. The plans should increase climate resilience and adaptive capacity for the nation and in the communities as well as consider new opportunities occurring from the climatic changes.

Michael Juel, Senior Consultant, Team Leader – Sustainable Management of Land & Environment (SMOLE II), Tanzania: The local authorities on Zanzibar have recognised the need for a climate change strategy and adaptation plan. NIRAS has assisted them in the preparation of a National Action Plan for Adaptation (NAPA) to ensure focus on the islands most urgent needs for onwards adaptive planning.

Natural resources are under pressure world-wide from growing populations and poor management. Climate change will further increase the stress on both natural and managed systems. NIRAS provide technical assistance in water resources and watershed management, livestock, fisheries, forestry and agriculture.



Henrik Borgtoft Pedersen, Senior Advisor: Watershed management is an integrated approach to natural resource management (NRM), and it is a very important tool in climate change adaptation. Through the appropriate management of water, soil and vegetation it is possible to counteract many of the negative consequences of climate change and even increase food production and water availability. NIRAS has considerable experience from watershed programmes in e.g. Bolivia, Tanzania and Bhutan.

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In countries like Mali, Mauritius and Sri Lanka, NIRAS works directly with water supply and management, supporting the national efforts to ensure availability of high quality drinking water now and in the future.

Sven Jacobi, Senior Consultant, Team Leader - Mauritius Water Resource Master Plan: NIRAS supports the water authorities in developing a water resource master plan to ensure water availability onwards. The plan also includes resilience measures towards a changed precipitation pattern, and salt water intrusion due to projected sea level rise and lowering of the water level on the coastal aquifers.



Extreme weather events pose a threat to many kinds of infrastructure. Projected climate change must be taken into account when planning new or remodelling old infrastructure, including roads, bridges, sewage systems, harbours and physical coastal zone protection measures. NIRAS has prepared holistic adaptation plans for cities in Denmark, worked with coastal engineering in Egypt and Ghana, harbours in Kenya and Sri Lanka, roads in Ethiopia and Ghana and sewage systems in Abu Dhabi.

Jesper Harder, Director: NIRAS supports infrastructure development in many parts of the world. Such development initiatives often have a life time of at least 30-50 years. Climate proofing the infrastructure developments during planning, design and implementation is fully integrated into our way of working, in order to ensure that they are adapted to the climatic condition expected to prevail in the future.



NIRAS also provides training in climate change. We have developed and conducted several courses and seminars in relation to climate change adaptation and mitigation. Regularly convened 3-week courses have been conducted on behalf of Danida Fellowship Centre (DFC) for stakeholders in developing countries.