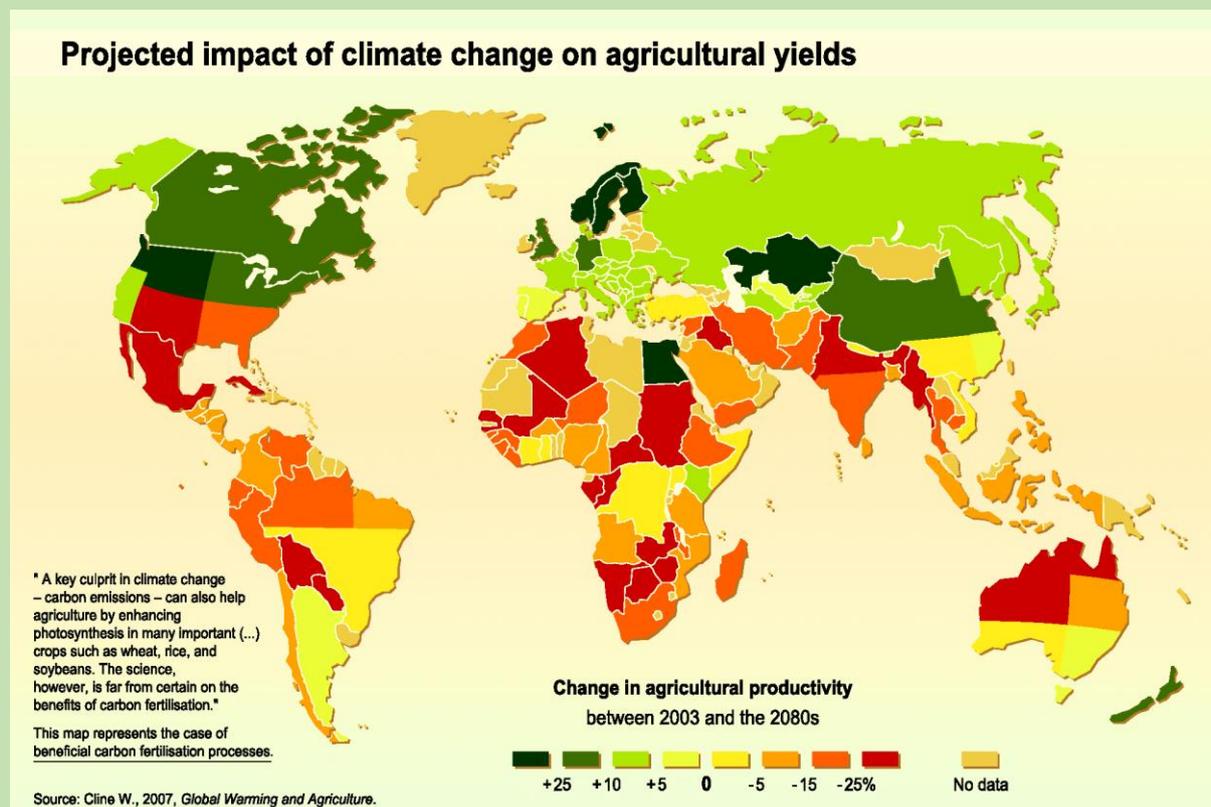


Climate Change and Agriculture: Issues and Recommendations

Climate change is causing an increase in temperatures, rainfall variations and the frequency and intensity of extreme weather events, adding pressure on the global agriculture system – which is already struggling to respond to rising demands for food as a result of population growth. The changing climate is also contributing to resource problems beyond food security, such as water scarcity, pollution and soil degradation. As resource scarcity and environmental quality problems emerge, so does the urgency of addressing these challenges.

Overall, from the Intergovernmental Panel on Climate Change (IPCC) Reports, in some regions agriculture productivity levels are expected to be lower than without climate change – due to changes in temperatures, crop water requirements and water availability and quality. Impacts of climate change on agricultural production will vary among regions and will depend not only on the intensity of the changes in temperatures and rainfall but also on how these factors interact.



Climate change is expected to negatively affect both crop and livestock production systems in most regions, although some countries may actually benefit from the changing conditions.

It is worth to note that the agriculture sector is also contributing a significant share of the greenhouse gas (GHG) emissions that are causing climate change –17% to 24% directly through agricultural activities and an additional 7% to 14% through changes in land use at global level,. The main direct agricultural GHGs emissions include nitrous oxide emissions from soils, applications of fertilisers, paddy rice cultivation, field

burning of agriculture residues, manure management, and methane production by ruminant animals (enteric fermentation). In addition, the sector generates emissions indirectly due to changes in land use, including land clearing and deforestation.

Agriculture is a vital sector in Africa, concentrating between 25% and 35% of direct jobs depending on the country, and is a source of income for almost 70% of the African population. Africa is predicted to be the continent that will be worst affected by climate change mainly because of its overreliance on climate sensitive sectors, its vulnerable populations and its poor land-use practices. If the international community does not take the measures necessary to reduce greenhouse gas emissions, an environmental, economic, and social catastrophe is bound to befall the African continent.



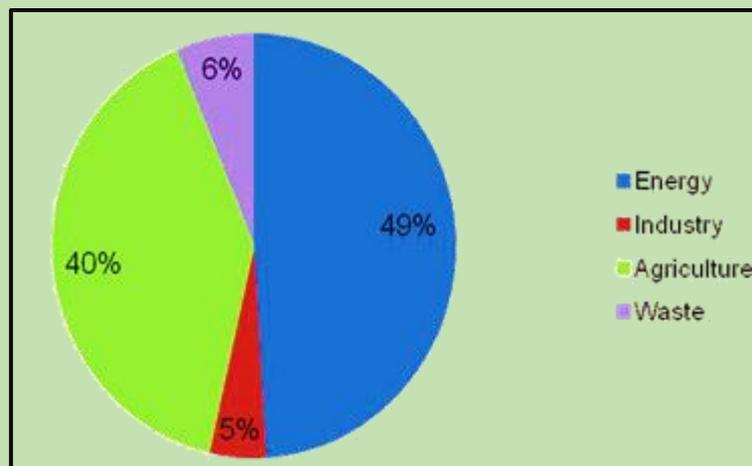
Impacts of climate change in Africa

In their Nationally Determined Contributions (NDCs), most African countries have prioritised climate change adaptation with a main focus on agriculture systems, from an adaptation perspective with mitigation co-benefits. Which is not however favorable to developed countries. NDCs are key instruments for Parties to communicate their

actions towards the achievement of the long term goals of the Paris Climate Agreement adopted in December 2015.

Droughts are becoming more frequent and severe in the southern Africa region, and that – combined with the recent El Nino phenomenon – is taking a heavy toll on rural lives and economies. In the 2015/16 agriculture season, due to this El Nino Phenomenon, successive maize harvests failed, leaving communities in Zimbabwe, Zambia, South Africa, Mozambique and other parts of the region, desperate for food. People exhausted their reserves and were left with no food to feed their families. Families mainly those in rural areas had to survive on eating and selling wild fruits.

Zimbabwe's economy is agro-based and more than 80% of the rural population's livelihoods are dependent on rain-fed agriculture making them highly vulnerable to climate change induced weather extremes, variability and impacts. The agricultural sector also provides 60 % of the raw materials required by the manufacturing industry and 40 % of total export earnings. In its NDC, the country prioritised climate change adaptation in the agriculture sector. In addition, the country is also committed to reduce its greenhouse gas emissions in this sector. Currently, the agriculture sector accounts for 40% of total average greenhouse gas emissions. However, the country's total greenhouse gas emissions contribute less than 0.05% of global emissions, making it a low emitter.



The distribution of Zimbabwe's emissions by sector (Source: SNC, 2012)

Adapting to Climate Change in the Agriculture Sector

Climate change adaptation emerge as the best option to climate-proof the agriculture sector and improve livelihoods, consequently eradicating poverty. Farmers have always adapted to changes in climate. The challenge now is to adapt within very short periods of time to potentially extreme impacts and new risks and opportunities. This will be achieved through a combination of managerial, infrastructural and technical measures. Measures include:

- i. Strengthening management of water resources and promote more efficient irrigation methods and water harvesting techniques
- ii. Promoting climate smart agriculture and the adoption of improved livestock breeds that are tolerant to climate related stresses.
- iii. Promoting the use of indigenous and scientific knowledge on drought tolerant crop types and varieties and indigenous livestock that are resilient to changes in climate.
- iv. Strengthening early warning systems on climate related agricultural risks.
- v. Putting more emphasis on incentives to enhance farmer capacity to adopt practices that contribute to sustainable productivity growth while also responding to climate change.
- vi. Promoting capacity building through research and development, education and awareness, and training in climate change related issues.
- vii. Promoting climate indexed insurance solutions and enabling market frameworks.
- viii. Building resilience in managing climate related disasters such as droughts, hailstorms, erratic rainfall and floods

What should policymakers do?

Without consistent policy signals, farmers may not be able to do enough to create a sustainable, productive and climate-resilient agriculture sector. Where there are market failures, where private costs are lower than social benefits, farmers will not invest enough in adaptation and mitigation in the agriculture sector. Moreover, farmers are often faced with conflicting policy signals. Some policies encourage production at the expense of climate change objectives, while other measures try to offset these negative effects. The Government needs to identify such policy inconsistencies and develop a coherent set of incentives for achieving sustainable productive growth with mitigation and adaptation as part of this effort. Achieving this will require involvement of the Government itself, the private sector and communities, with policy solutions tailored to reflect private and social costs and benefits. Some situations will call for national and international cooperation, others for local or regional initiatives.

At the national level: The signals sent by the wider social, economic and environmental policy settings should consistently support sustainable productive growth in combination with adaptation and mitigation efforts. The agriculture sector is subject to a wide range of influences, including innovation, macroeconomic, trade, investment, infrastructure, and education and training policies. Moreover, the general *education level of farmers* has a significant effect on how farmers are able to absorb innovative, climate smart and resource efficient practices. The Climate Policy (2017) expressed the need for broader reforms in such areas and scale up education, training and public awareness in order to achieve sustainable agriculture production and climate-proof the sector. The National Climate Change Response Strategy (2014) mainstreams climate change through a sectoral approach (*among them is the agriculture sector*) to ensure that each sector implements adaptation and mitigation actions. A comprehensive approach to assess gaps and improve coherence with other policies (social, economic and environmental) will in Zimbabwe be more effective than

marginal fine tuning of existing agricultural policies.

Further investment in research and development is needed to spur innovations in sustainable climate-friendly and climate-proof productivity. Research and Development (R&D) programmes can play an essential role in this respect. The Government can enable the development of private innovations by, for example, addressing investment barriers that impede R&D, ensuring that private knowledge is disseminated, and encouraging, where suitable, public-private partnerships (PPPs) for R&D with public goods and outcomes.

Strengthening access to knowledge and transfer mechanisms is key to increasing adoption of sustainable and productive practices. Relevant and up-to-date information on climate smart agriculture packages, risk management and resource use efficiency can stimulate uptake of innovative technologies that support sustainable and climate-friendly interventions. In terms of risk management, access to tools that assess future weather conditions (e.g. weather forecasting or early warning systems) enable farmers to take pre-emptive actions to minimise the negative effects of extreme events. Training and education about changing climate conditions and the long-term viability of different agricultural practices help farmers and other private agents to make educated investments in adaptation and mitigation. In view of the numerous existing advisory programmes, it is often advisable to streamline adaptation and mitigation actions into existing institutions and to co-ordinate such actions with the private sector. Agencies that deliver advice, training and extension services to support sustainable farm management will need to be well co-ordinated, effective in reaching different interest groups and types of farming, and capable of delivering a full range of services.

Financial incentives can encourage farmers to adopt measures that have high upfront costs, or that are socially beneficial but costly at the private level. For adaptation, the Government has an important role to play in supporting infrastructure projects – at the watershed level – that increase productivity and promote the efficient use of resources.

For any further information, contact the **Climate Change Management Department** on +263-4-701681-3 or climatechange@environment.gov.zw
Website: www.climatechange.org.zw
Facebook page: [#Climate Change Management Dept](https://www.facebook.com/ClimateChangeManagementDept)
Address: **11th Floor, Kaguvi Building, Cnr S.V Muzenda Street and Central Avenue, Harare**