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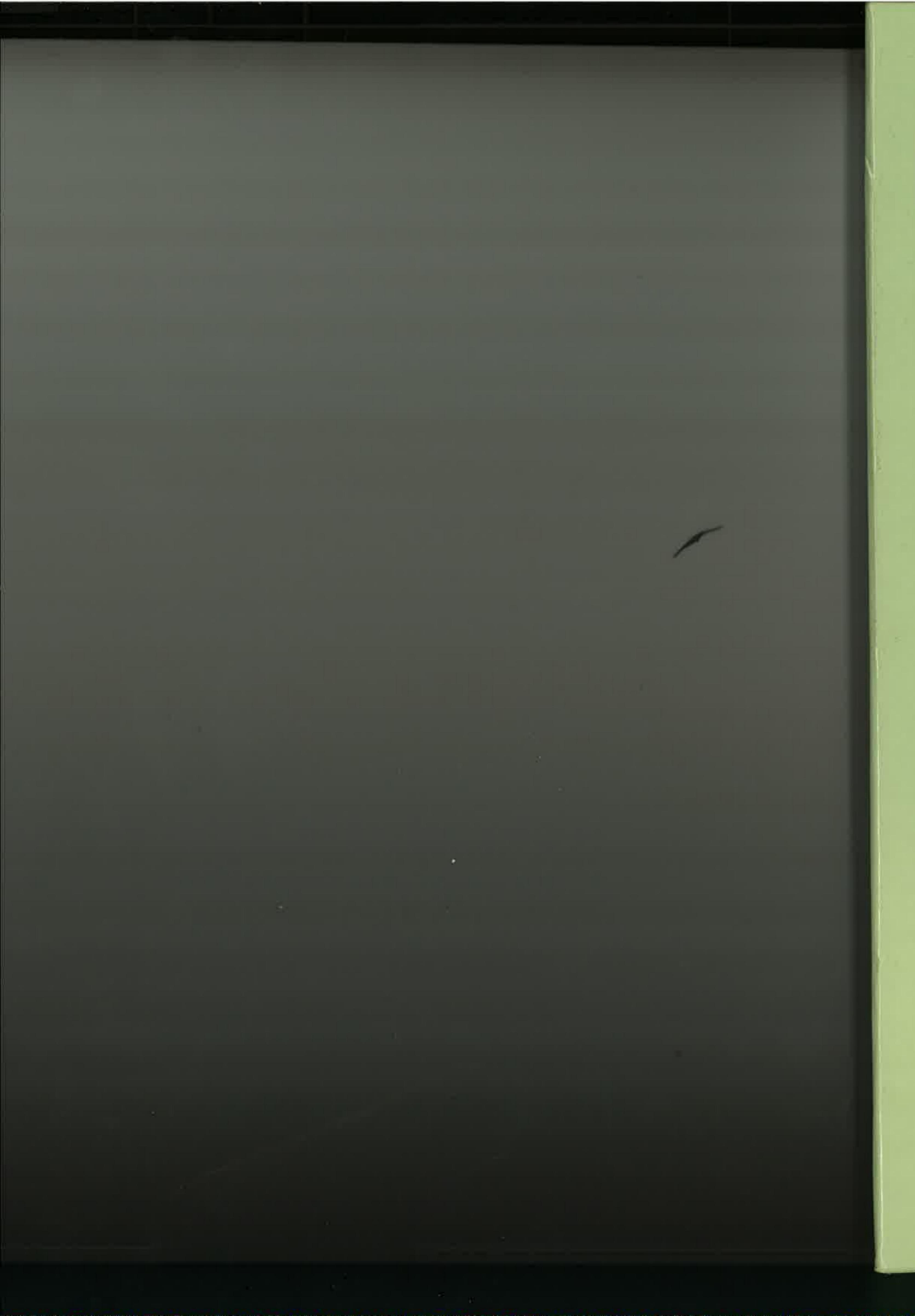
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Climate Change and Agricultural Food Production Impacts, Vulnerabilities & Remedies

The book "Climate Change and Agricultural Food Production: Impacts, Vulnerabilities and Remedies" is an attempt to address the important facts and figures relating to climate change impacts on agricultural food production based on: a. climate change impacts on various food production sectors, namely agriculture, livestock and fisheries; b. food contamination, food safety and food security issues related to climate changes; c. adaptation and mitigation measures to counteract or minimise or reduce the effects of climate change on agriculture, livestock and fisheries, and d. the green house gas (GHG) emissions from agriculture, livestock and fisheries sectors. Climate change is projected to have an effect on:

- With higher temperatures and overall decreased water supplies, beef-cattle and sheep are likely to experience increased incidences of stress related deaths; the other climate change related effects on livestock are reduction in animal weight, reproduction rates and milk yields.
- Climate change has both direct and indirect impacts on fish stocks that are exploited commercially. Rise in sea temperature have already caused in shifts in distribution of marine fish towards both north and south poles (e.g. cod, common sole, sardines, anchovies have moved towards north pole) and some fish species also found moving to deeper areas with warming.
- Climate change will affect all four dimensions of food security food availability, access to food, stability of food supplies and food utilization.
- All quantitative assessments show that climate change will adversely affect food security in sub-Saharan Africa and South Asia.
- The adaptation can be considered as tackling the effects of climate change, whereas mitigation is tackling the cause of climate change such as reducing the sources or enhancing the sinks of GHGs.
- Adaptation in agriculture includes appropriate crop selection; development of heat/drought and more disease and pest tolerant crops; breeding of rice cultivars resistant to climate change such as salt, drought or flood tolerant varieties; adjustment of planting dates or changing the cropping calendar; alternative cultivation methods; cultivation of fast growing crops; diversification (integrated agriculture-fish farming); rainwater harvesting; soil conservation/control of soil erosion; sustainable water management; crop rotations; zero tillage; soil fertility management; alternate wet and dry rice culture etc.
- Adaptation in livestock may include breeding of livestock's for greater tolerance to heat stress; responsive stocking rates for extensive livestock; summer housing for dairy cattle (intensive livestock); matching stocking rates with pasture production.
- To tackle water shortages and water crisis adaptations strategies may include water savings, water recycling, seepage loss prevention, new irrigation pipelines, desalination, wastewater reuse and new water supply.
- Furthermore, some other actions can be taken including building adaptive capacity by increasing support for research and knowledge, promoting awareness and improving weather forecasting technologies. Adaptation in fisheries can be achieved by adjusting fishing operations, as well as by applications of scientific and technological advances.

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