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Climate Change in the context of African
agriculture and the role of the law reform



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Agriculture key to African development

Snapshot

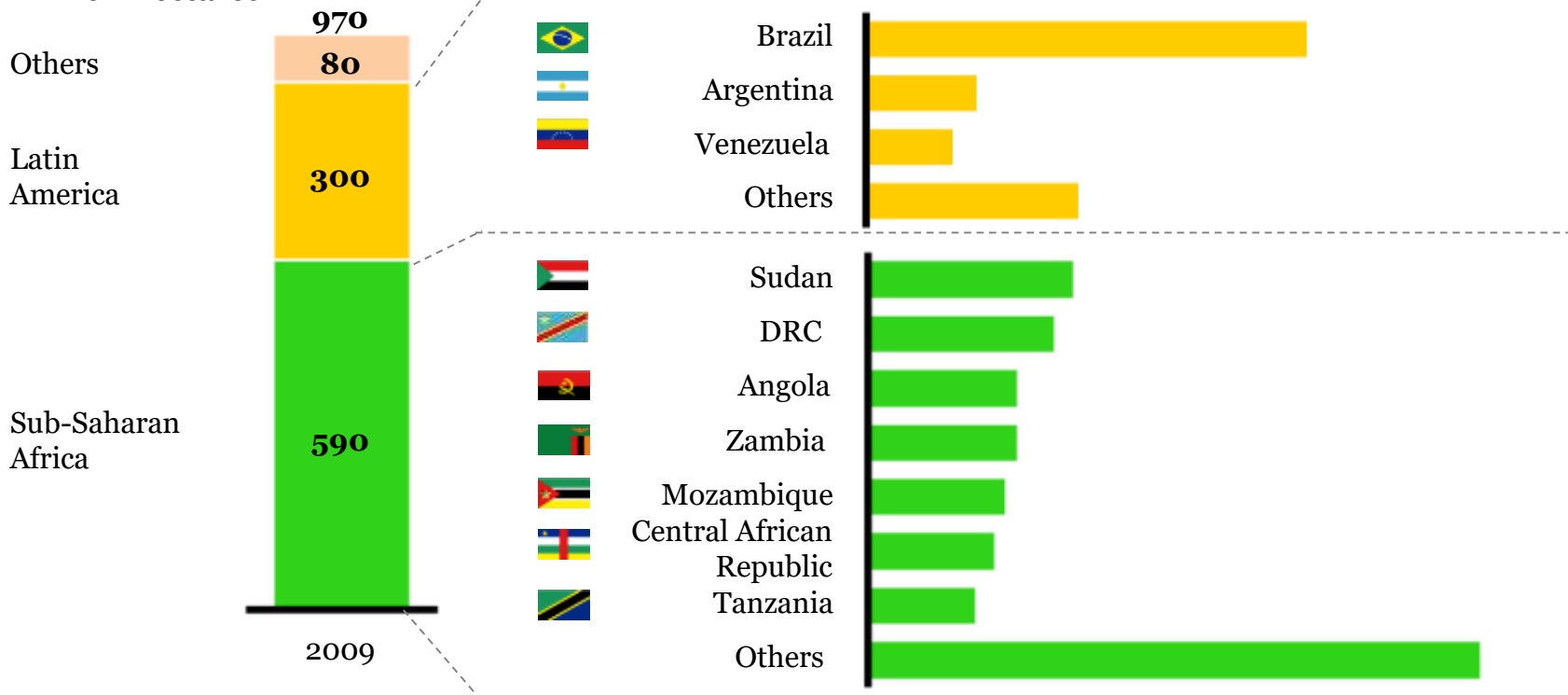
World Bank Report (2017)

- African economy dominated by mining and agriculture;
- 70% of African involved in Agriculture, but it accounts for 33% of GDP;
- Dominated by smallholders and household producers;
- Agriculture commercialising, but constrained by access to finance, biotech, irrigation infrastructure and formal markets;
- High prevalence of household producers increase vulnerability to climate shocks.



Additional available cropland, 2009¹

Million hectares



1. Source: McKinsey Global Institute as referenced by Prof Marcos Fava Neves, Agbiz Congress 2018

The country's size in this map represents the size of the population. Each square [■] represents 500,000 people. All 15,266 squares show where the world's 7.633 billion people live.

by Max Roser for OurWorldinData.org – the free online publication that presents the data and research on how the world is changing.

Population data from the U.S. Population Division.

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Our World
in Data

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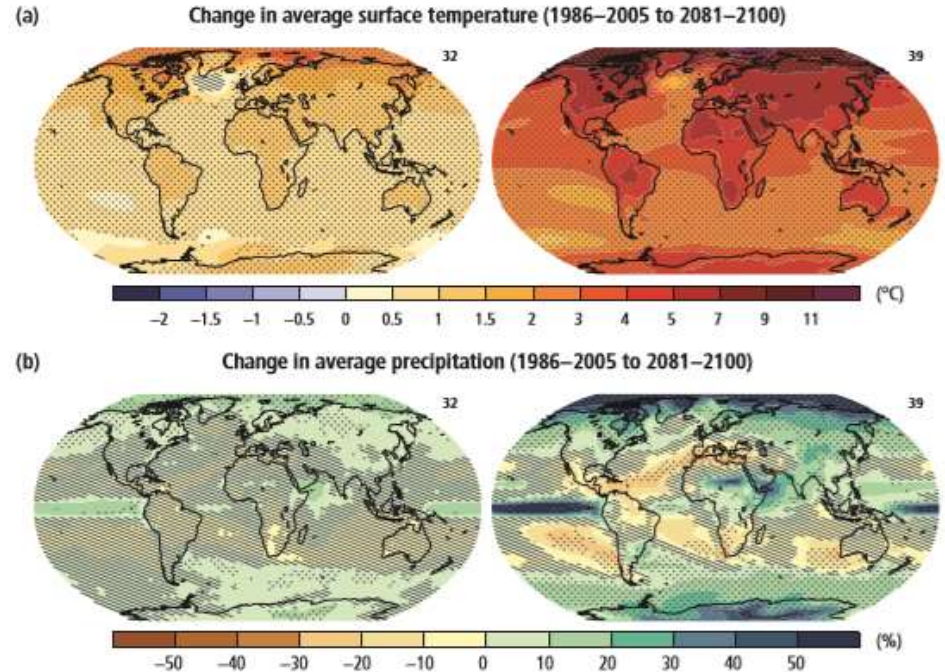
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 LexisNexis

Worrying facts...

According to the IPCC:

- 2-3% of the world's Green House Gas (GHG) emissions; but
- Will be hardest hit – average temperature raising at 1.5X global average of 0.2°C per decade;
- 20% average reduction in rainfall compared to levels 20 years ago;
- Increased frequency of severe weather events such as droughts, floods and cyclones;



United Nations Framework Convention on Climate Change

Paris Agreement (2015)

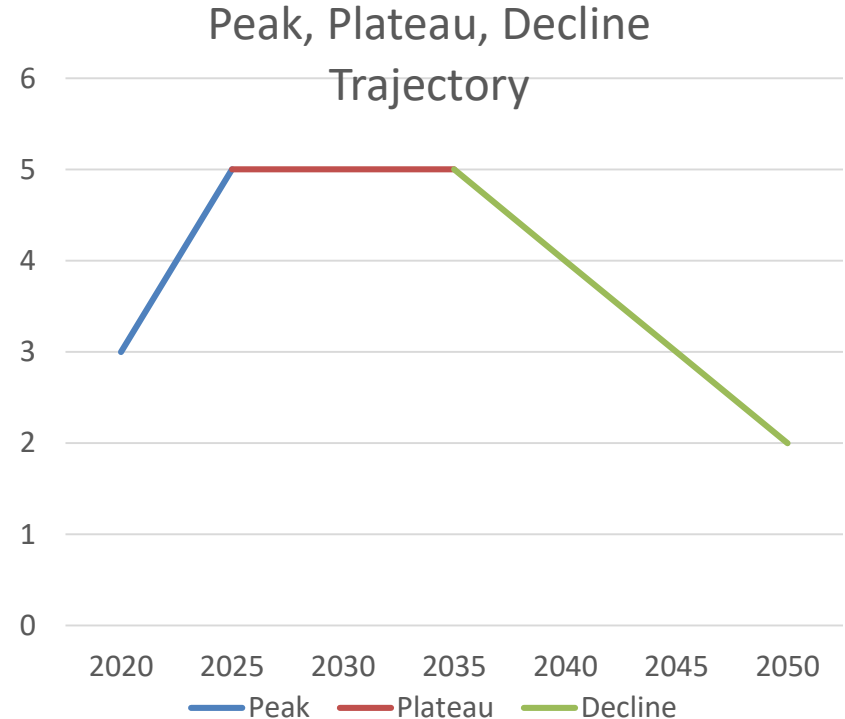
Mitigation

- Keep global warming to 1,5°C by 2100;
- Many developing countries adopted a 'peak, plateau, decline trajectory';
- Allow for 'Nationally Determined Contributions';
- Give developing countries more leeway than developed;
- Conserve carbon 'sinks' – forests, grasslands etc.

Adaptation

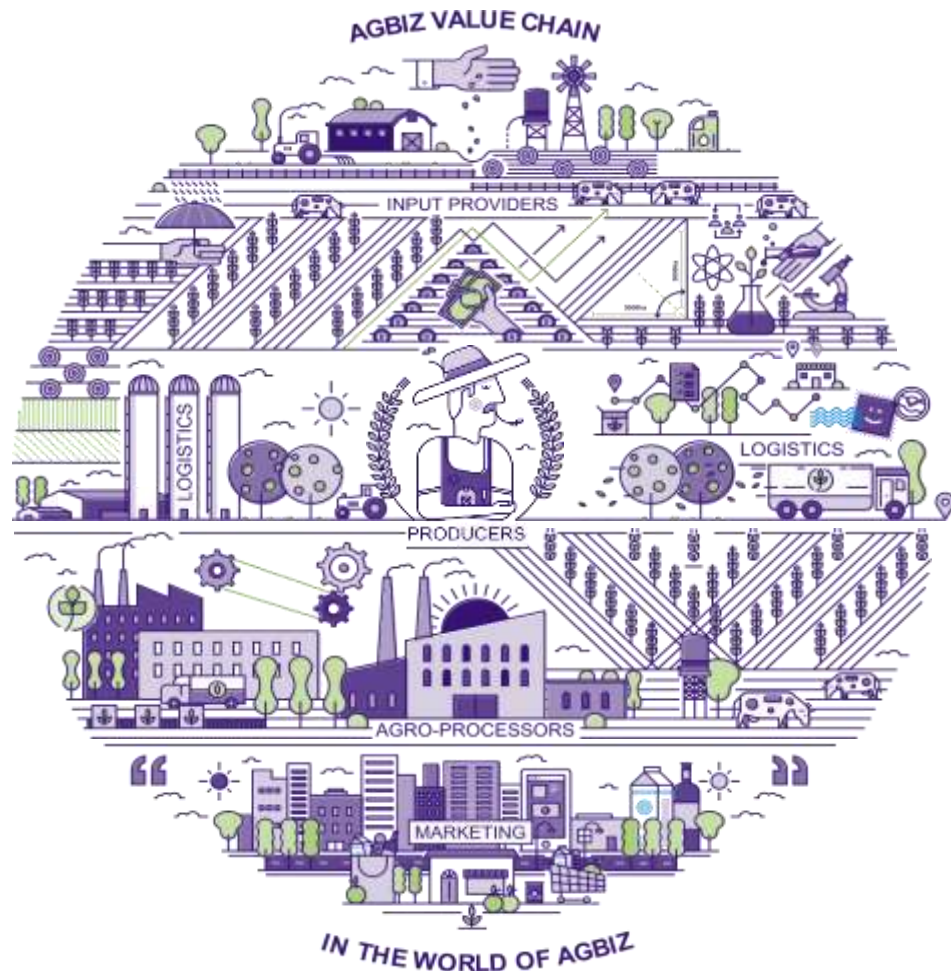
- Each country must develop a plan to:
 - Enhance adaptive capacity;
 - Strengthen resilience; and
 - Reduce vulnerability.

NB! Each country has to develop legal instruments!



Mitigation not primarily aimed at farmers but can affect agriculture

- Value-chain approach;
- Many countries have imposed carbon taxes (e.g. SA & soon Senegal & Cote d'voire);
- Other countries include some form of carbon pricing in NDC (e.g. Egypt, Gabon, Botswana, Burkina Faso, Chad, Kenya, Nigeria, Rwanda etc)
- Carbon pricing through budgets or tax can on the manufacture of fertilizer can flow-through to primary agriculture;
 - Fertilizer can account for up to 40% of input costs in crop production (Grain SA:2018);
- Carbon pricing on diesel & energy generation can also affect costs of irrigation, ploughing & logistics.



Adaptation key

A number of interventions are required to improve resilience, including:

- Conservation & no-till agriculture;
- Disaster management strategies;
- Irrigation & storage facilities key etc.

Role of the legal reform?

- Incentivise spending on biotech research;
- Credit legislation;
- Natural resource stewardship.



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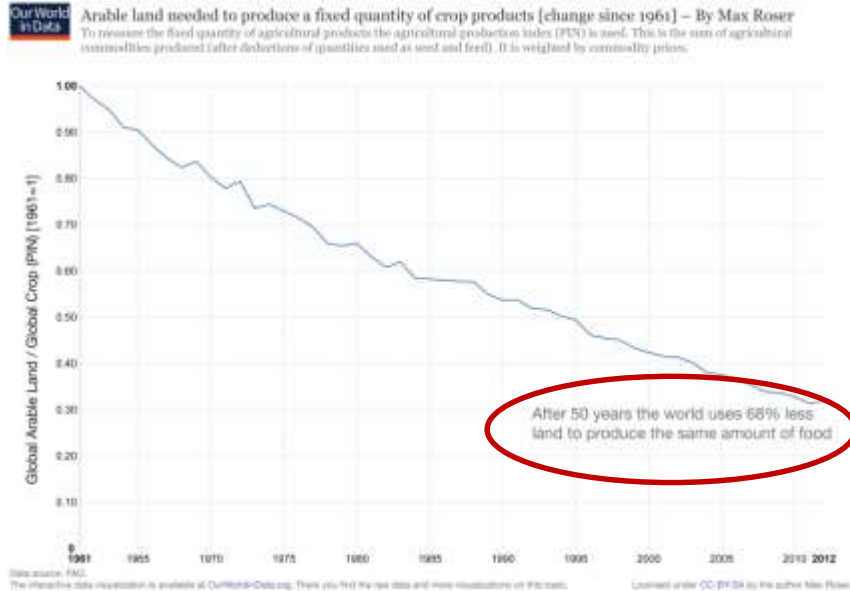


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The effect of biotechnology

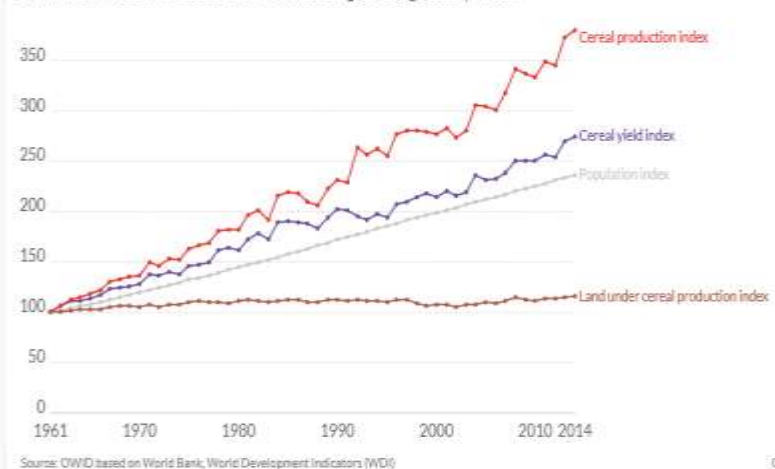
Global area planted



Global production

Index of cereal production, yield and land use, 1961-2014, World

The index of total cereal production (measured in metric tonnes), cereal yield (kilograms per hectare), and land used for cereal production (hectares). The index is calculated as the production, yield and land use in any given year divided by that in the year 1961 (i.e. 1961 = 100). The index of total population (all ages and genders) relative to 1961 is also shown. Trends for individual countries can be viewed using the "change country" wheel.



Enablers required for biotech

- Greater yields and drought resistant;
- Precision farming & conservation agriculture all play a role but the right genetic material is key;
- R & D in biotech is a multi-billion dollar industry;
- Recognition of Plant Breeder's Rights (IP) paramount to attract investment into R&D.

Drought-tolerant maize produces **20-30% HIGHER YIELDS** in dry conditions.



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Considerations of fairness paramount

- IP recognition - incentive for R&D spend v increased costs to farmers

International Convention for the Protection of New Varieties of Plants (UPOV 1991)

- Article 14: “Breeder’s Rights” – 20 to 25 year’s exclusive protection.
 - no one may produce, condition, sell, export or import a protected variety without the consent of the breeder (usually subject to royalties).
- Article 15 (2): “farmer’s privilege / farm-saved seeds”
 - Farmers may use seeds of a protected variety if harvested from their own fields for propagation (planting); but
 - limited to use on own holdings and may not sell to other farmers (i.e. farm-saved).



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The boundaries shown on this map do not imply the expression of any opinion whatsoever on the part of UPOV concerning the legal status of any country or territory.

Delicate balancing act

- Less than half of African nations are part of the UPOV conventions;
- Where Plant Breeders' Rights are protected, an estimated 80% of seeds planted in Africa are farm-saved seeds (SACTA, 2019);
- African nations being limited consumers of biotech since 1990, but lagged in ability to attract R & D spending – only accounts for 0,8% of global spend (Goldsmith & Nauriyal, 2007);
- IP protection required to stimulate investment; but
 - Does the system of farm-saved seeds provide adequate protection of farmers' interests in a continent categorised by small-holder and small-scale farmers?
 - Are there alternatives?



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Different collection system could be key

Extended Royalty System

- Royalties paid when purchasing seeds;
- Common in Europe, Argentina & factored into purchase price when seeds are sold in non-UPOV countries;
- **Advantage:** guaranteed benefit for Breeders;
- Easy to administer;
- **Disadvantage:** disadvantages farmers in variable climates;
- Royalties are paid even if the entire crop is lost.

Endpoint royalty systems

- Royalties paid on harvests;
- Used in Australia and new in South Africa;
- **Advantage:** Good for variable climates;
- farmers' payment obligation linked to success of harvest;
- **Disadvantage:** only suitable for countries & commodities with formal value chains – measured when crops are delivered to silos, millers etc.
- Not suitable for subsistence farming, which is commonplace in many African countries.

Credit & Financial Sector Regulation

Agri sector reliant on credit for liquidity

- Large turnover but small margins;
- no fixed income – seasonal with high variability;
- Credit key to ‘ride out the rough years’ and purchase seeds, fertilizers, chemicals etc.

Many African credit laws not conducive to commercial agri development & many farmers finance agriculture through savings & off-farm employment

- Consumer focus v business focus;
- Repayment history v seasonal prospects:
 - Variable climate = erratic repayment history; but
 - Farmer at fault?
 - Weather forecast often more important than repayment history.



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Natural resource stewardship

Command and Control approach

- Focused on strict law enforcement;
- E.g. Kenya, South Africa & Botswana;
- Achieved results in biodiversity management but poor track record for managing other resources such as water quality & forests;
- NB – *Thaba Metsi case*; emissions part of EIA studies;
- New legislation to prevent mining in areas of high agricultural potential & sensitivity water catchments;

Community based natural resource management

- Based on sustainable use concept;
- Communities receive benefit from sustainable use & hence act as stewards.
- E.g. Zimbabwe, Namibia, Uganda, Tanzania
- NB – Promote concepts such as conservation agriculture for adaptation; &
- Discourage 'slash & burn' rangeland management.



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