Emerging Technologies and Governance System in Africa

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Outline

1. Emerging Technologies: *An Array of Tools*

2. Regulations for Modern Technologies: *Overview*

3. Evolution of GM Regulation in Africa

4. Concluding Remarks
Emerging Technologies

- An array of applications!!!!
- Biotechnology – *Genetic Engineering, Genome Editing*
Genetic Engineering: *Early breakthroughs*

- Characterization of DNA structure (Watson & Crick)
- Discovery of DNA genetic blueprint (Avery-Macleod-McCarty)
- Discovery of Restriction Enzymes; DNA Ligases
- Successful cloning of viral DNA fragment in bacterial plasmid (Jackson et al. 1972)
- Recombinant insulin produced in GM *E.coli*
- Transgenic crops created by 4 groups:
  1. Ghent, Belgium
  2. Washington Univ, US
  3. Monsanto, US
  4. Univ of Wisconsin, US
- Commercial approval of GM crops:
  1. FLAVR SAVR
  2. Bt Crops

Timeline:
- 1945: Discovery of DNA genetic blueprint
- 1953: Characterization of DNA structure
- 1965: Discovery of Restriction Enzymes; DNA Ligases
- 1972: Successful cloning of viral DNA fragment
- 1975: Recombinant insulin produced
- 1983: Transgenic crops created
- 1986: Commercial approval of GM crops
- 1996: Timeline end
Safety focus was on contained research, production systems and release of GMOs
Biosafety Regulation in Africa...Influencers!

OBJECTIVE:
In accordance with the precautionary approach contained in Principle 15 of the Rio Declaration ... is to contribute to ensuring an adequate level of protection in the field of the safe transfer, handling and use of LMOs resulting from modern biotechnology that may have adverse effects on the conservation and sustainable use of biological diversity...

African Model Law on Biosafety

Built on the Protocol with calls for adoption of extreme interpretation of the Precautionary Principle emphasizing risk, and specifically Strict Liability and Redress
“Precautionary Principle and Practice”

“...where there are threats of serious of irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation....”.
During the last 30 years, African countries have made various endeavours to develop National Biosafety Frameworks (NBFs). This involves:

1. **National Policy on Biotech.**
2. **Legislation on Biosafety.**
3. **Institutional system** for handling applications and law enforcement.
4. **Mechanism for engaging public participation.**
National Biosafety Frameworks ..(2): *Twists and Turns*
Genome editing (aka gene editing) is a group of technologies that give scientists the ability to change an organism's DNA.

Genome editing allow genetic material to be added, removed, or altered at particular locations in the genome.
Regulatory Environment for Genome Editing

- Regulatory oversight for Gene editing still a polarizing a subject

- **Europe:** In 2018, Court of Justice of the European Union (ECJ) Ruling on GM and GEd

- **Africa:** Nigeria and Kenya have Guidelines distinguishing GM from GEd
Conclusions

• Governments have a role of ensuring that product approval is premised on safety & SECs

• In Africa, regulation for GMOs attracted new policies, legislation & institutions – generally angling for pre-caution, even prevention – e.g. Bans on GMO Food Imports!

• Setting regulatory standards on an ordinately high threshold, runs risks of preventing/stifling advancement of STI

• Africa needs a rigorous, responsible and predictable regulatory environment to take products of STI to market
Thank you in different languages:

- asante
- aciu
- kiitos
- dank u wel
- danke
- dziękuje
- kop khun kha
- takk
- tack
- merci
- dankie
- arigatô
- elharisto
- obrigado
- spacibo
- mahalo
- gracias
- Thank you