
Biotechnology regulatory systems: implications for food security and rural livelihoods

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The African Ministerial Conference on Science and Technology (AMCOST) in 2007 identified the application of modern biotechnology as having the potential to help address food, feed, fibre and fuel needs as well as contribute to combating diseases, malnutrition, hunger and poverty. This decision was taken against the backdrop that enhancing food security and livelihoods – despite growing populations, depleting natural resources and potential threats from climate change – was a major challenge confronting African governments and policy makers as well as international development agencies. It was noted that accessing and harnessing the potential of modern biotechnology would require well-trained human resources, appropriate infrastructure, knowledge-based innovations, financial mechanisms and functional regulatory systems.

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A functional regulatory system would enable the efficient and competent assessment of potential risks and benefits together with ensuring that regulatory decisions are made in a science-based, informed and timely manner. To this end,

most African countries either acceded to, or ratified, the Cartagena Protocol on Biosafety, which seeks to guide parties in establishing functional regulatory systems that would enable a platform for the exchange of scientific and technical information and, ultimately, biosafety decision making. Although many African countries have developed some features of their biosafety systems for regulating agricultural biotechnology, to date only four countries – Burkina Faso, Egypt, South Africa and Sudan – commercially cultivate genetically engineered crops.

The nature of the problem

Today, many African countries have biotechnology policies, regulations and strategies, but then a look across the continent reveals limited capacity within national systems in regulatory decision making despite the efforts of a number of global, regional and sub-regional biosafety initiatives over the years. Observations by the New Partnership for Africa's Development (NEPAD) Agency's African Biosafety Network of Expertise (ABNE) indicated that significant variations in decision making exist between countries with apparently similar national regulatory systems. However, empirical evidence to explain these variations and to identify constraints that have impacted on the decision-making processes was lacking. Our study was therefore explanatory research aimed at understanding the issues that impair the functionality of biosafety systems as well as best practices that can be adapted by other countries in Africa. This was achieved by exploring the factors that influenced the differential ability of seven Sub-Saharan African countries to implement functional regulatory systems. Factors

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examined included the current state of regulatory capacity; the features that define agricultural biotechnology policy and biosafety regulatory regimes in the selected countries and their role in decision-making processes concerning genetically modified (GM) crops; countries' scientific and administrative capacity for risk assessment and risk management processes and procedures; and institutional arrangements for biosafety decision making.

Methodology

To understand the issues that affect the functionality of biosafety systems, qualitative surveys and desk reviews of official documents were used to obtain both primary and secondary data. A comparative case study methodology was used to analyse differences between the seven African countries selected from West Africa (Burkina Faso, Ghana and Nigeria), East Africa (Kenya and Uganda) and Southern Africa (Mozambique and South Africa) through the review of literature, multi-stakeholder surveys and focus group discussions. The target research population included regulators, scientists, industry practitioners, farmer-based organisations, consumer associations, non-governmental organisations, policy makers and decision makers. Cross-sectional data were used to further interpret the case studies and analysis of the different country scenarios. To achieve the desired mix, purposive sampling was employed to interview at least 30 respondents within each national system.

Key survey findings

Countries in Sub-Saharan Africa that have made progress in the management of modern biotechnology were found to have enabling environments –

regulatory and business-friendly – characterised by political will and a commitment to implement policy together with adequate legal authority, effective regulatory oversight roles and timeliness in regulatory processes. In such systems, biotechnology was identified as a development tool, and benefits from the use of the technology were weighed with risks in decision making. The risk assessment was a science-based or safety consideration and did not include socio-economic factors. The associated risk management measures proposed were commensurate with identified risks and likelihood of occurrence. However, socio-economic considerations and national priorities played a big role in the final decision making. The study also revealed that countries that delayed decision making did not quite understand the risk assessment process and often adopted an onerous approach. Risks thus were overemphasised, were associated with draconian provisions on liability and redress, and were also inappropriately linked to socio-economic considerations.

The study observed that within each regulatory system there were some influencers who positively or negatively contributed to regulatory processes depending on their viewpoints. These influencers, who operated either as individuals or groups, were not seen as target audiences for biosafety capacity strengthening, but turned out to be game changers in the evolution of regulatory systems towards functionality. They included politicians, local government leaders, community leaders, farmer groups, religious bodies and the

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media. These are powerful constituencies that have not necessarily been the focus of biosafety capacity building but which, when adequately informed, easily serve as biosafety champions. Countries that benefited from these supporters described the key attributes required of an impactful biosafety champion as:

- being politically connected and influential within the geopolitical space;
- being committed, involved and open to support from other team members;
- being blessed with a pleasant voice that resonates well in the ears of political leadership and catches their attention;
- having the ability to build bridges;
- being a good negotiator;
- understanding his/her role and able to discern relevance and timeliness;
- being imbued with a peripheral awareness enabling the seizure of opportunities that may periodically arise.

A key finding was the nuances of engaging with politicians to engender interest, cooperation and commitment. This requires an understanding of the politician's thought processes. Noting that political office is usually term-bound, most politicians will listen if they believe the message will further their political agenda. However, existing disconnects between science, technology and

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innovation (STI) on the one hand and livelihood issues such as food security, access to potable water and lives saved on the other have resulted in low interest and low prioritisation and commitment from politicians.

Regarding communicating STI issues with politicians, it was noted that messaging and message delivery were a challenge. Politicians were observed to visualise issues in an “anticlockwise” direction in that they would rather begin a conversation by discussing an exciting solution, only then moving on

to understand how it works and the reason for it. The classical model of identifying a problem, then stating the objectives, methodology and findings was unappealing to politicians who, given the limited time frame, were interested in practical and relevant solutions that they could share with the electorate. Countries where politicians positively supported biosafety processes, including enactment of the law and allocated budgets to support biosafety administrative processes, were those that perceived links to livelihood issues and, by extension, the socio-economic development agenda.

Of the various areas of capacity-strengthening endeavours – human resources, administrative handling of applications, risk assessment, decision making, communication and mechanisms for coordination – biosafety communication was identified as the key weakest link. There is a need for a communication rethink. This requires an effective strategy and a long-term approach including integrating biotechnology and biosafety into academic curricular, training science communicators and continuous public engagement. However, this public engagement must be conducted in a manner that ensures a clear distinction between biotechnology communication and biosafety communication. The study also revealed that myths and misperceptions that were not addressed within regulatory systems undermined

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later communication efforts. In addition, the public did not view biosafety as a subject matter that was compartmentalised into technical areas such as food safety, environmental safety and socio-economic considerations. Their concerns were usually a mixed bag of issues. Interactions with the media also revealed a dearth of engagement on various fronts, with media personnel pointing out that – unlike opponents of the technology – biosafety communicators scarcely provided the media with headline stories or information resources such as photographs.

The study also revealed that African countries have competent human resources that either go unrecognised or are placed in positions of little relevance to biosafety processes. For the competent personnel appropriately positioned within national systems, high turnovers and a lack of quality management systems in some regulatory systems were seen to undermine progress. There is a need for strategic and continuous capacity strengthening and dialogue to address these issues. Biosafety issues were observed to be like a jigsaw puzzle requiring a mix of strategies. Strategy development must be iterative, situational and dynamic. Domestically led processes ensured ownership and progress but this in part depended on partnerships to leverage resources for success. Some countries made strides with partners providing background technical support while stepping back from public view. Transparency, however, was an essential issue in building confidence in biosafety systems. Systems that made progress were engaged in multi-stakeholder involvement at critical steps, including decision making. Better

relationships were built through understanding and consulting stakeholders, ensuring clarity of roles and responsibilities, and regular, open and transparent communication.

It is envisaged that the findings of this study will assist African regulators and policy makers to adopt policies and strategies to improve the efficiency of the biosafety decision-making process and reap the benefits of biotechnological advances while minimising the potential risks. This study will be an invaluable resource and a catalyst for increasing the number of functional regulatory systems across Africa, thus ensuring equitable access to good technology and sharing of benefits while protecting farmers, consumers and the environment. The project has been an important contribution to the NEPAD Agency's thematic programme on agriculture and food security.

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