Policy Brief

Modern biotechnology, solution for food safety and public health

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Executive summary:

In Burkina Faso, like the rest of Africa, agriculture, and health are two strategic sectors facing several difficulties that can go so far as to undermine human dignity.

In the agricultural sector, agricultural production, largely depend on rainfall, struggles to meet the needs of the populations, forcing the country to import a significant part of its food needs.

In addition to the insufficiency and poor distribution of rainfall, the sector faces several other constraints linked to the vagaries of climate change with its attendant pests and disease pressure. The shortage of labor aggravated by low uptake of mechanization in the agricultural sector further complicates the problem.

In Burkina Faso, there is a gradual reduction in arable land due to strong population pressure. This phenomenon has deteriorated rapidly over the last one decade due to insecurity crisis which is forcing farmers to abandon their farms. In this context, the question remains about the nations capacity to produce enough food to meet its regular needs and also address the food and nutrition

“Coordination Nationale des Concertation”.

security needs of more than two million (9.9% of the population) internally displaced people.

As if this were not enough, in addition to the food and nutritional crisis, there is a health crisis dominated by a malaria epidemic which caused numerous deaths (4,000 deaths by 2022). This situation is exacerbated by the resurgence of dengue and the emergence of new diseases such as chikungunya.

Modern biotechnologies, through genetic engineering, offer powerful scientific tools capable of developing alternative technologies that allow more sustainable use of the limited land resources and offer sustainable solutions for strengthening food/nutritional security and sustainable development.

Introduction:

The food and health security of the population are government priorities. The government and its technical and partners have taken a number of initiatives to boost the performance of the country’s agricultural and health sectors. With an agricultural population estimated at 82% (FAO), Burkina Faso’s agriculture is characterized by the production of cereals such as millet, sorghum, corn and rice; pulses such as cowpeas and voandzou; and oilseeds such as groundnuts and sesame.

The agricultural sector remains one of the key sectors of the national economy, contributing around 35% to the Gross Domestic Product. With an estimated agricultural area of 5.7 million hectares, the country’s agricultural sector faces a number of challenges that adversely affect its overall performance. In addition to the much more widespread practice of subsistence farming by households, and the strong tendency towards extensive farming, there is the instability of rainfall with pockets of drought, attacks by pests and diseases, and the low level of mechanization and use of technologies promoted by national research. In addition to these constraints, the country is experiencing a strong tendency to reduce its farmland due to the pressure of insecurity caused by the emergence of terrorism. Burkina Faso is struggling to achieve food self-sufficiency. On the health front, the country is facing strong pressure from vector-borne diseases including malaria, dengue fever and chikungunya.

To respond to these emergencies, Burkina Faso adopted a set of reference policies. Some of these include the “National Roadmap for the Transformation of Food Systems to support the 2030 Agenda” in 2021; the “Action Plan for Stabilization and Development (PA-SD)” adopted in January 2023 and the “National Multisectoral Nutrition Policy (2020-2030)” adopted in 2020.

In the midst of food insecurity, health and security crisis, modern biotechnologies offer safe alternatives capable of boosting food and health outcomes.

I. Alternatives to major challenges

Modern biotechnologies, through genetic engineering and genome editing, offer solutions to many of the constraints encountered in various fields.

Modern biotechnologies to boost agricultural productivity

Burkina Faso has participated in the 76th United Nations General Assembly on Sustainable Food Systems. As a prelude to the country’s participation in this international meeting, national consultations conducted under the aegis of the Prime Ministry and the ***Coordination Nationale des Concertation*** led to the drafting of a reference document listing the major constraints affecting the various links in the food system, and setting out major strategic actions to promote them. Among the solutions proposed was the use of modern biotechnologies in the production and valorization of local food products.

In recent years, scientists around the world have been developing numerous technologies to promote sustainable, environmentally-friendly and much more productive agriculture. Among these technologies are improved varieties of various crops, designed specifically as solution to major challenges:

1. Agri-biotech solutions to drought

TELA Maize technology, now being grown commercially in South Africa and Nigeria, while Kenya, Ethiopia Mozambique are at advance stages of commercialization, could serve as an alternative to maize production in the country's arid zones.

This technology enables maize to overcome drought to produce and allow growers to harvest.

2. Biotech solutions against pests

A variety of pests cause major yield losses for farmers. From aphids to caterpillars, the main crops. Scientists are proposing solutions for the following:

a. Bt cotton

Cotton is the leading cash crop in Burkina Faso. Cotton cultivation is subject to heavy pressure from bollworms. This forces producers to make excessive use of chemical products on cotton in order to better control the pest. Introduced in 2008, genetically modified cotton has made a major contribution to reducing the quantities of pesticides discharged into the environment for cotton cultivation alone, and increasing cotton productivity, with yields ranging from one (01) tons per hectare to two (2) tons. Many cotton farmers for whom the withdrawal of this cotton was a bad deal, believe returning to the cultivation of Bt cotton would make the sector prosper again. In the past Bt cotton has made a major contribution to improving farmers' living conditions through substantial income gains and reduced workload.

b. Pod Borer Resistant Cowpea

A sub-regional project involving Nigeria, Ghana and Burkina Faso on the development of cowpea varieties resistant to the pod borer was funded by the AATF. For more than 10 years, research teams from the three countries have been working on this biotech-solution against Maruca vitrata which is the major constraint on cowpea. This harmful insect can cause yield losses of 20 to 80%. For the moment, insecticide treatment constitutes the only means of combating this pest. The use of chemical insecticides on food crops can be catastrophic for human and animal health. For this purpose, cowpea resistant to the pod borer presents itself as an alternative of choice for lasting control of the pest. It guarantees cowpea productivity and reduces the excessive use of chemicals on this common consumption crop.

c. Bt maize

In recent years, attacks by fall armyworm have been observed in maize fields, both in the rainy season and on off-season maize. This new scourge has dealt a heavy blow to the vast majority of corn producers.

As an immediate solution, the Ministry of Agriculture advises the use of insecticides approved for the control of this devastating pest.

It should be noted that the treatment of maize fields with insecticides is a completely new act for producers in Burkina Faso; insecticide treatments were rather well known on cotton, cowpea and vegetable crops.

In the absence of insecticides recommended by the ministry, producers do not hesitate to use any other insecticide, most often of unknown origin. In most situations, insecticides have been ineffective against fall armyworm. In addition, these chemical insecticides sprayed directly on the maize plants represent a health danger for the producers themselves, and consumers that we are likely to ingest chemical residues in the crops.

The alternative technology that has proven itself across time and space remains genetically modified maize varieties (Bt maize). This technology allows sustainable control of the devastating caterpillar and presents no danger to humans, animals and our environment. Its distribution to farmers would make it possible to improve maize production in areas subject to pressure from the pest.

3. Modern biotechnologies to improve the nutritional quality of foodstuffs

Golden rice technology

Malnutrition affects many young children, pregnant women and the elderly. Golden rice, a technology developed by scientists and rich in provitamin A, offers an effective way to manage vitamin A deficiency, which is responsible for blindness and many serious diseases in vulnerable populations. Golden rice, "food-medicine", can be promoted to resolve this major challenge linked to malnutrition.

4. Modern biotechnologies, a solution for improving public's health

Genetically modified mosquitoes

In the field of health, biotechnologies, through genetic

engineering and genome editing, offer promising alternatives to fight diseases such as malaria or dengue fever. Genetic modification to control the population of mosquitoes responsible for the transmission of these diseases remains a promising solution for the control of vector-borne diseases.

5. Modern biotechnologies: a scientific solution for boosting the country's socio-economic growth

The use of biotech solutions in the agro-pastoral and health sectors would increase agricultural productivity and reduce the impact on public health. The adoption of biotechnological innovations could make a major contribution to the availability of food products and guarantee food security.

The use of biotechnological solutions would not only improve the living conditions of producers, but also contribute to the overall health of the population, by reducing investment in malaria control alone to cover other diseases.

The safe use of biotechnologies in Burkina Faso is ensured by the National Biosafety Agency through law n°064-2012 / AN on the Biotechnology safety regime adopted since 2012.

II. Implications

The adoption of biotechnology crops in agriculture and health care would imply the adoption of a national biotechnology policy and sectoral policies in agriculture and health care. In addition, watchdog institutions will need to be set up to monitor the information disseminated on technologies mechanisms will need to be put in place to deal with complaints relating to the use of these technologies. All this will help to strengthen the contribution of science to the country's development.

Conclusion

Biotechnology innovations are solutions that decisions makers should consider. To meet today's major challenges, including famine and public health, biotechnological solutions need to be explored, their use encouraged and supported by all possible safety measures.

Policy Recommendations:

- Adopt a national policy on modern biotechnologies.
- Adopt a sector-based policy for modern biotechnologies in agriculture.
- Adopt a sector-based policy for modern biotechnologies in heath.
- Promote the use of Bt cotton in areas heavily affected by pests.
- Promote the use of transgenic maize varieties that can thrive in arid zones and agroecological zones experiencing an invasion of Fall armyworm and stem borers such as TELA Maize and other varieties.
- Promote the use of Pod Borer Resistant Cowpea (PBR Cowpea) in areas under pressure from Maruca Vitrata.
- Promote research on golden rice and apply research outputs to boost food and nutritional security among vulnerable groups facing deficiencies.
- Promote genome-edited solutions for the fight against endemic vector-borne diseases such as (malaria, dengue, chikungunya).
- Set up a national mechanism for monitoring information and misinformation on modern biotechnologies and encourage fact-checking and instant feedback on biotechnology inquiries among the citizens.

References:

- Law n°064-2012 / AN of December 20, 2012, on the biotechnology safety regime
- Law N°006-2013/AN establishing the Environmental Code in Burkina Faso
- Law n° 010-2006/AN of March 31, 2006 regulating plant seeds in Burkina Faso
- National food and nutrition security policy
- National Multisectoral Nutrition Policy 2020-2029
- Agropastoral and fisheries offensive 2023-2025

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