
CASE STUDY – SCIENCE ADVICE WORKSHOP

GONSWANA

Food insecurity and new technologies

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Note: The elements presented in this case study are fictitious and must not be interpreted as real people, locations or events.

Background

Gonswana is a constitutional republic that elects a president every seven years and representatives every five. The nation's topography is diverse, ranging from semi-desert to lush forest and plateaus suited to agriculture. Thanks to favourable weather conditions, Gonswana is primarily agricultural. It is home 52 million citizens, and its gross domestic product per capita is \$1 250. Certain regions, in which a small number of luxury ecolodges are in operation, are popular nature tourism destinations.

Despite its progress, Gonswana remains one of the region's least developed nations, relying on modest income from corn, lumber and oil exports and its budding tourism sector. Surveys conducted following a recent drought reveal that the country's weak economic growth, chronic food insecurity and the social impacts of rapid urbanization are sources of concern among citizens. Indeed, in the last few years, Gonswana has experienced major agrarian changes. Approximately 70% of Gonswanans earn a living through agriculture and livestock production. Agriculture practices are mainly traditional and for subsistence, and farmers are not always able to keep grain reserves from one year to the next. Several foreign entities have acquired a large number of acres—nearly one-third of the country's arable land—to implement an intensive agricultural system for export. Local communities see a threat to their traditional ways of life and employment prospects and fear they will not be able to support their families.

International experts affirm that, with climate change, Gonswana will face more intense cycles of drought and rain that will impact crop growth. In addition, in three of the past five years, the rains that followed a particularly severe drought fostered the emergence of swarms of locusts in several countries in the sub-region, forcing many families to leave their communities for towns and cities in search of work.

A decade ago, Gonswana adopted a policy regulating the use and marketing of genetically modified organisms (GMOs) in an effort to reconcile the country's specific ecological characteristics and economic constraints. Since then, the government has encouraged the use of modified seeds to stimulate yields and corn exports to the detriment of traditional seeds. To address the production gap, the government has implemented an agricultural strategy that supports the use of crop protection products and chemical fertilizers. Because Gonswana does not possess the necessary infrastructure, foreign multinationals dominate the seed, fertilizer, herbicide and pesticides markets.

In several regions across Gonswana, local communities are expressing their concerns regarding monoculture, which, they believe, has damaging effects. They do not understand why they must source their seeds from foreign businesses year after year and fear they will not be able to purchase them should a regional political or economic crisis arise. They also express concern over the rapid disappearance of milu—an ornamental and medicinal plant used in many traditional Gonswanan ceremonies.

Issue

A research consortium including eminent experts from the National University of Gonswana recently announced that it was about to launch the final phase of its new locust control method. Using a gene editing technique, the researchers were able to alter the pheromone gene leading to the development of locust swarms. When locusts whose gene has been altered are released into a swarm, their pheromones disrupt the behaviours of wild locusts by preventing them from swarming. The researchers affirm that the insects are not a risk for humans and that their release has no negative environmental impacts. The researchers consider their method to be a model for safe biological control.

Food for All, a non-profit organization, is the project's main financial partner. It is currently in negotiations with the government of Gonswana to carry out tests under real conditions this year. The effort will involve a number of Gonswanan universities and research centres and could lead to the creation of a high-tech centre to develop locusts with the edited gene. The technology, which would serve all countries facing locust swarms, could position Gonswana as a regional leader in research and development and, in time, represent a key source of income.

The FAO's locust information service, which conducts daily monitoring of the ecological conditions leading to swarms, notifies the government of Gonswana that a major swarm is likely to occur in the Mendou region within the next four to six weeks. Given the situation, local authorities have established a chemical control plan to limit damages but are slow to implement it. In Mendou and the surrounding areas, there are rumours that the government will release the insects to destroy the crops of farmers who did not vote for the ruling party in the last elections.

At the same time, an association of monoculture farm businesses is pressuring national and regional governments to implement measures as soon as possible to curb the swarms. Some members are working to facilitate the release of genetically modified locusts, though there has yet to be a public or policy debate on the technology's social acceptability.

Needing to act quickly, the government of Gonswana consults its scientific advisor on the possible scenarios. What elements should the government's scientific advisor consider in her report?

Photo: Swarm of locusts in Madagascar, Iwoelbern, [Wikimedia Commons](#)



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