

Series 2 – Social Pillar: Environment, Water, Sanitation and Regional Development

Cactus invasion: A Threat to Biodiversity and Food Security

Dr Eunice W. Githae

Key Messages

Invasive cactus degrades rangelands and reduces availability and accessibility of pasture and other natural resources.

Cactus invasion reduces biodiversity hence affecting ecosystem goods and services that are essential for human well-being.

There is limited information and lack of public awareness on the harmful impacts caused by invasive cactus.

Rural households lose between 50 and 100 thousand shillings a year because of cactus

Plate 1: Beautiful yellow flower of the pear cactus
(Photo: Stan Shebs, CC BY-SA 3.0, <https://commons.wikimedia.org/>)

Context

The prickly pear cactus has a negative impact on food security, biodiversity and human well-being. The cactus invades mostly arid and semi-arid lands (ASALs), which form more than 80% of Kenya's landmass. Livestock keeping is the main socio-economic activity in these areas. The plant is hardly appreciated due to the presence of spines and glochids (small spines on fruits) that cause injuries to people and livestock. In Narok County, the cactus invasion has increased rapidly over the last five years and has displaced people and pasture (Githae, 2018). The plant has been present in Laikipia County for more than 10 years and has invaded grazing land, contributing to the death of livestock and wildlife (Shackleton et al., 2017).

Several conservancies and national parks have also been invaded by the plant. The plant is not only a serious threat to a wide range of wildlife but also to plant diversity. For example, in the Serengeti-Mara ecosystem, prickly pear cactus is among the intentionally introduced plants that have displaced grass and other fodder plants (Witt et al., 2017). It has also occupied more than 500 km² in the Tsavo East National Park and its surrounding areas (CABI, 2018). In Naibunga conservancy, the plant has occupied about 17,000 acres of land and invades at least 2 km of habitat per year (Daily

Nation, 2017). The potential costs associated with the invasion of natural pasture are based on reduced grazing land, replacement of natural pasture, negative impacts on livestock health, and reduced mobility of livestock. Although the full cost of the impacts of cactus invasion in Kenya has not yet been quantified, rural households lose between 50 and 100 thousand shillings a year because of cactus (Shackleton, 2017). With the current changes in climate, the plant is likely to be a growing problem to rural livelihoods if appropriate measures to control its spread are not put into place.

Prickly pear cactus is among the most common introduced invasive plant in Kenya. Originally from America, the plant is widespread in the arid and semi-arid areas. Prickly pear is a spiny shrub with different shapes, which has attractive yellow flowers and purple-reddish fruits (Figure 2 and 3).

The cactus has invaded Asia, Africa and Europe. In Africa, it has been reported in several countries, including Eritrea, Ethiopia, Namibia, Morocco, South Africa and Kenya. The counties most widely invaded in Kenya are Samburu, Narok, Laikipia, Baringo, Nakuru, Kajiado and Taita Taveta with small patches occurring in the neighbouring counties. Cactus pear was first introduced in Laikipia in the early 1950s as an ornamental plant. Today, it has spread far and wide mainly through human use, for example as ornamental plants or as live fences. However, these uses cannot



compensate for the overall negative impacts exposed by the invasion.

Their seeds are dispersed by baboons, birds and elephants. Broken pieces are scattered by animals as they move from one place to another. The plant can survive well during prolonged drought and the seeds can stay in the soil for almost two years as they wait to sprout during the rainy season. These characteristics enable the plant to be more aggressive than others.

Controlling and Preventing Further Spread

The most applied methods of controlling cactus are manual such as chopping, burying and burning. These are difficult, involve a lot of labour, and cannot provide a lasting solution. Chemicals, on the other hand, are used after chopping but the plant regenerates after some time. The control of prickly pear cactus in other countries such as South Africa is entirely reliant on a bio-control insect, which was also introduced in a pilot project in Laikipia and showed a positive result. However, local pastoralists reported that the insect was released in a few areas and the plant was spreading faster in the neighbouring areas where it had not invaded before, especially in the mountains and valleys (Daily Nation, 2017). Complete removal of cactus plants may also leave the ground bare that could lead to further environmental degradation. Successful management of the plant, therefore, requires an integrated management plan of the infested areas.

Several national strategies have a focus on biodiversity conservation through control of invasive alien species. These include the National Wildlife Strategy 2030, the Kenya Vision 2030, and the National Strategy and Action Plan for the Management of Invasive Species in Protected Areas in Kenya. Based on these, this brief recommends several approaches to manage and reduce the negative impacts of cactus invasion that can be applied by the Ministry of Environment, Water and Natural Resource, Ministry of Agriculture, Livestock and

Fisheries, Ministry of Tourism, and county governments that are affected by the invasion. These could lead to functional and resilient ecosystems that can support livestock production and wildlife; restored and conserved biodiversity; and high level of awareness and understanding of the harmful effects, possible solutions and best practices.

Policy Recommendations

Short-Term

- Map and list threatened areas and species to improve biodiversity conservation.
- Identify possible areas of future invasion based on human activities and climate.
- Increase awareness and understanding of the harmful effects of cactus invasions and their possible solutions and best practices. This can be through the development of educational materials and undertaking public outreach.

Medium-Term

- Rehabilitate open areas with indigenous trees.
- Develop and implement policy guidelines to prevent further invasion.
- Rehabilitate and restore rangeland eco-systems through integrated management plans.

Acknowledgements

Preparation of this policy brief was supported by the AgriFose2030 program, International Livestock Research Institute (ILRI) and the Regional Strategic Analysis and Knowledge Support System (ReSAKSS) with financial support from the Swedish International Development Agency (SIDA). I wish to thank Stephen Wambugu for his valuable technical input and Anne Nyamu for the excellent editorial support.

References

- CABI *invasives factsheet* (2018). <https://www.cabi.org/Uploads/CABI/news/Cactus-Factsheet.pdf>
- Dairy Nation July 11 (2017). Killer cactus. <https://www.nation.co.ke/lifestyle/dn2/Killer-cactus/957860-4010324-n7hx7hz/index.html>
- Githae, E. W. (2018). Status of *Opuntia* invasions in the arid and semi-arid lands of Kenya. *CAB Reviews*, 13(3), 1-7.
- Shackleton, R. T., Witt, A. B., Piroris, F. M., & van Wilgen, B. W. (2017). Distribution and socio-ecological impacts of the invasive alien cactus *Opuntia stricta* in eastern Africa. *Biological Invasions*, 19(8), 2427-2441.
- Witt, A. B., Kiambi, S., Beale, T., & Van Wilgen, B. W. (2017). A preliminary assessment of the extent and potential impacts of alien plant invasions in the Serengeti-Mara ecosystem, East Africa. *Koedoe*, 59(1), 1-16...

Author

Dr Eunice W. Githae
(amon.karanja@egerton.ac.ke)
Department of Geography, Egerton University,
Box 536, Egerton, Kenya

Cactus purplish-red fruits.
(Photo: Julian Colton CC BY-SA 4.0,
<https://commons.wikimedia.org>)

