Endangered and Ignored: The Bee Crisis Taking Root in Somalia's Drylands

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Introduction

Bees are among the most vital and irreplaceable species on the planet. Being a natural pollinator, they have a key function in ecosystem health and global food production. More than 75% of flowering plants on Earth and over one-third of all agricultural production depend on pollination, most of which is done by bees. This silent labor sustains forests, fosters diversity, and energizes plant reproduction that feeds wildlife and people. Without bees, entire ecosystems would collapse and global food security would be at risk.


Swarm of bees, Huddur, Somalia /photo credit ICRC

Their economic value is immense as apiculture contribute billions of dollars annually to the agricultural industry by improving crop yields. Across the African continent, where farm work comprises a high proportion of the workforce, bees are adding to food production and generating off-farm livelihoods through honey, beeswax, and other hive products. Beekeeping is now a key source of rural livelihood, women's income, and smallholder farmer income in countries such as Ethiopia, Kenya, Tanzania, and Uganda. With deforestation, climate change, and the use of chemicals threatening biodiversity, apiculture is an inexpensive, sustainable means of making a living.

Somalia, like other African nations, is beginning to consider the untapped potential of bees. In its arid and semi-arid regions—like Puntland, Somaliland and the riverine south—beekeeping is beginning to appear to be a reasonable means of making a living. Honey is a nutritious food and a traditional medicine, and domestic demand is growing.

One of the major challenges is that there is limited public awareness. There is limited knowledge among most Somali communities, particularly rural communities, of the environmental and economic importance of bees. Bees are not necessarily associated with honey only, as compared to their role as a pollinator and producer of foods. Limited education, poor literacy rates, and the absence of environmental extension or media coverage drive this ignorance. Folkloric explanations sometimes associate bee swarms with danger rather than potential.

Islam also places deep value on bees. The Qur'an honors bees in **Surat An-Nahl (The Bee)**, revealing their purpose and the healing power of their work:

وَأَوْحَىٰ رَبُّكَ إِلَى ٱلنَّحْلِ أَنِ ٱتَّخِذِى مِنَ ٱلْجِبَالِ بُيُوتًا وَمِنَ ٱلشَّجَرِ وَمِمَّا يَعْرِشُونَ. ثُمَّ كُلِى مِن كُلِّ ٱلثَّمَرَٰتِ فَٱسْلُكِى سُبُلَ رَبِّكِ "ذُلُلًا ۚ يَخْرُجُ مِنۢ بُطُونِهَا شَرَابٌ مُّخْتَلِفٌ أَلْوَٰنُهُۥ فِيهِ شِفَآءٌ لِّلنَّاسِ ۗ إِنَّ فِى ذَٰلِكَ لَءَايَةً لِّقَوْمٍ يَتَفَكَّرُونَ"
(68–69)

This verse highlights not only the divine inspiration given to bees but also their ability to produce honey that serves as healing for humankind. Islam urges believers to reflect on such signs and act as caretakers of creation (**khalīfah**). Therefore, protecting bees is not only an ecological and economic necessity—it is a spiritual duty.

In this light, bees must be seen as more than insects—they are the lifeblood of ecosystems, guardians of food security, and a sacred trust for humanity. Preserving them ensures the survival of nature, the dignity of livelihoods, and the fulfillment of our divine responsibility on Earth.

Importance of Bees: Ecology, Biodiversity, Economy, Health

1. Bees as Pollinators in Ecosystems

Bees are nature's most efficient and widespread pollinators, responsible for fertilizing more than three-quarters of the world's flowering plant species. This process of pollination enables the production of seeds and fruits, which are vital for plant reproduction and the food supply of countless other organisms. Through their natural behavior of foraging for nectar and pollen, bees inadvertently transfer pollen grains between flowers, triggering fertilization and enabling new plant life. This seemingly simple activity is, in fact, the foundation of terrestrial ecosystems and global food systems.

In agricultural landscapes, pollination by bees is directly linked to the productivity and quality of numerous crops. Fruits, vegetables, nuts, and oilseeds such as melons, pumpkins, sunflowers, and sesame depend heavily on bee pollination for yield formation. In regions like Somalia, where subsistence farming is a major livelihood activity, bees play a silent yet crucial role in supporting household nutrition and income generation. Without bees, many food crops would fail to reach full production potential, threatening food security in already vulnerable communities.

Pollination is also essential in the reproduction of wild plant species, many of which serve as forage for livestock or raw materials for medicine, firewood, and construction. The acacia species in Somalia's drylands—such as *Acacia tortilis* (Qudhac) and *Acacia seyal* (Galool)—rely in part on

insect pollinators, especially native bees, to sustain their growth. These trees are not only critical for grazing but also for controlling desertification and sustaining microclimates in arid regions. A reduction in pollinator activity may therefore accelerate land degradation and ecological imbalance.

The decline of bees, caused by habitat loss, pesticides, climate change, and disease, directly undermines the stability of these interconnected systems. As bee populations dwindle, the quality and quantity of both wild and cultivated crops decrease, reducing the availability of seeds, fruits, and plant matter across trophic levels. In turn, this threatens herbivores, predators, and humans alike. Ensuring the survival of bees is thus a foundational component of environmental stewardship and agricultural resilience, particularly in fragile ecosystems like those of the Horn of Africa.

2. Biodiversity Conservation

Bees are integral to the preservation and enhancement of global biodiversity. By enabling plant reproduction through pollination, they maintain the genetic diversity of wild flora and cultivated crops. This genetic diversity is crucial for plant adaptation to changing environments, including evolving pests, diseases, and climatic conditions. In natural settings, bees help sustain plant communities that serve as habitats and food sources for countless organisms, from insects and birds to mammals and reptiles. Thus, bees indirectly support the survival of a wide range of species and the ecological functions they perform.

In Somalia's arid and semi-arid ecosystems, biodiversity is already under immense pressure from desertification, overgrazing, and deforestation. The presence of native bees helps maintain the flowering cycles of drought-resistant plants that stabilize the soil, reduce erosion, and maintain water cycles. Certain wild plants that depend on insect pollination also provide traditional medicinal compounds and raw materials for rural communities. The loss of pollinators would therefore mean the collapse of these vital ecological services, undermining both environmental and human well-being.

The presence of diverse pollinator species also builds ecological resilience. When a variety of bee species coexist in a given ecosystem, their differing foraging patterns, nesting habits, and climate tolerances help ensure that pollination continues even during environmental fluctuations or disease outbreaks. This functional diversity offers a natural insurance policy, buffering ecosystems against shocks and enhancing their ability to regenerate after disturbance. In monoculture landscapes with limited pollinator diversity, however, the entire system becomes fragile and prone to collapse.

Human activity—particularly habitat fragmentation, pesticide misuse, and unsustainable land use—poses the greatest threat to bee diversity. Conservation efforts aimed at protecting bees must therefore go beyond the species themselves and focus on the preservation of entire ecosystems. This includes maintaining flowering plant diversity, limiting harmful chemical inputs, and restoring degraded landscapes. By placing bees at the center of biodiversity conservation strategies, Somalia and similar countries can foster more sustainable, adaptive, and ecologically inclusive development.

3. Economic Contribution of Bees

Bees are vital contributors to the global and local economy, particularly through their role in agricultural productivity and the production of marketable hive products. The pollination services bees provide are estimated to be worth hundreds of billions of dollars annually. Crops that depend on bee pollination tend to produce more fruits and vegetables of higher quality, better shape, and longer shelf life, making them more valuable in local and international markets.

In regions like sub-Saharan Africa, this can make a substantial difference to smallholder farmers whose livelihoods depend on successful harvests.

In Somalia, where agriculture and pastoralism dominate the rural economy, the economic potential of bees remains largely untapped. Beekeeping, or apiculture, can serve as a low-cost and climate-resilient livelihood option that complements farming and herding. Hive products such as honey, beeswax, royal jelly, and propolis are in high demand both domestically and abroad. Somali honey, especially from highland regions like Sanaag, is traditionally valued for its purity and medicinal properties. Yet most of the honey consumed in Somali cities today is imported, reflecting a missed economic opportunity.

Beekeeping also offers inclusive development potential. It requires minimal land and startup capital, making it accessible to women, youth, and people living in remote areas. With appropriate training, equipment, and market access, small-scale beekeepers can generate substantial income while also contributing to food production and biodiversity conservation. In post-conflict and drought-affected areas, beekeeping has shown promise as a sustainable income source that does not deplete natural resources or compete with food crops for land and water.

Despite these benefits, the beekeeping sector in Somalia remains underdeveloped due to lack of government support, poor infrastructure, and limited technical capacity. Investments in modern hive technology, value chain development, and cooperative marketing could unlock the economic potential of bees and improve livelihoods across rural Somalia. By integrating bees into national development planning, Somalia can diversify its economy, reduce poverty, and build climate resilience in its agricultural systems.

4. Bees and Human Health

Bees contribute significantly to human health in both direct and indirect ways. The most well-known bee product—**honey**—is not only a nutritious natural sweetener but also a therapeutic substance with antibacterial, anti-inflammatory, and antioxidant properties. Traditional medicine systems across cultures, including Somali healing practices, have long used honey to treat wounds, sore throats, burns, stomach ailments, and skin infections. Its low moisture content and acidic pH create an inhospitable environment for bacterial growth, making honey an effective topical antiseptic.

Recent scientific studies support these traditional claims. Medical-grade honey has been used in hospitals to promote wound healing and reduce infection. Honey also contains small amounts of vitamins, minerals, enzymes, and phenolic compounds that contribute to its health benefits.

Additionally, other bee products such as **propolis**, **bee pollen**, and **royal jelly** are now being explored for their immunomodulatory, anticancer, and neuroprotective effects. This places bees at the center of natural health and nutrition discussions in both traditional and modern contexts.

The indirect health benefits of bees are just as important. By pollinating a wide variety of fruit, vegetable, nut, and seed crops, bees contribute to the availability of micronutrient-rich foods that are essential for human health. Without pollinators, the diversity and nutritional value of human diets would decline significantly, leading to increased risks of malnutrition, especially in low-income and drought-prone regions. In Somalia, where access to diverse food sources is already limited, maintaining pollination services is essential for food quality and public health.

As bee populations decline globally, the risk of losing access to these natural health resources increases. The replacement of local honey with cheaper, processed imports not only affects cultural practices but also undermines health outcomes. Protecting bees is therefore not just about conservation or agriculture—it is a public health issue. Investments in local apiculture and pollinator-friendly farming can help ensure that rural communities retain access to safe, natural, and affordable health-supporting products derived from the hive.

Pollinators Under Pressure: Factors Driving Bee Decline in Somalia

Until recently, it was common to hear the gentle hum of bees weaving through the acacia trees and flowering shrubs in Somalia's rural landscapes. In many regions—particularly Puntland, Galmudug, and parts of the southern and central states—local communities harvested honey from wild hives as part of their cultural and livelihood practices. Elders recall how, barely a decade ago, finding bees in the bush or collecting honey during grazing was as routine as fetching firewood. Today, however, if you visit these same areas and ask pastoral families about honey or bee activity, the response is sobering: "**Bees have almost vanished. What once surrounded us is now rarely seen."**

This ecological shift has immediate implications for food systems, biodiversity, and cultural continuity. Rural beekeeping traditions are disappearing as natural hives decline and flowering plants become scarcer due to overgrazing, drought, and land degradation. Beekeepers in parts of Waqooyi Galbeed, Sanaag, Sool and Lower Shabelle, report that entire seasons pass without harvest. Children in many villages grow up without seeing a beehive or tasting locally sourced honey—marking a generational disconnect with nature.

One of the clearest indicators of this decline is found in Somalia's urban markets. In the past, honey sold in cities like Mogadishu, Garowe, Hargeisa, and Kismayo was primarily supplied by rural communities. Today, however, a significant portion of honey consumed in urban centers is imported—mainly from Yemen and Ethiopia. Market vendors frequently advertise "Malab Yemen" (Yemeni honey) or "Malabka Itoobiya" (Ethiopian honey), not because of preference, but due to the scarcity of local production. This shift has economic and ecological consequences: Somalia is now reliant on imported honey despite having a natural environment rich in pollinators. The decline of self-sufficient honey production indicates a larger deterioration of ecosystem services.

Furthermore, Somalia lacks a national pollinator monitoring system, therefore the situation is often overlooked in policy and public discourse. However, the indications are everywhere: reduced food yields, failing colonies in introduced contemporary hives, and limited flowering as a result of drought and deforestation. Agricultural communities report reduced fruiting in crops such as watermelon, guava, lemon, and pumpkin, indicating pollination failure. In these areas, the silent disappearance of bees could have disastrous consequences for both environmental stability and food security.

This decline is not merely an environmental issue; it is a socioeconomic and cultural emergency. Without immediate interventions—community awareness, habitat protection, and national pollinator strategies—Somalia risks not only the extinction of its bees but also the unraveling of ecosystems and livelihoods that have long depended on them. These are factors cause bees decline and risk to endangered in Somalia:

1. climate change and droughts

Climate change is one of the most important hazards for biodiversity worldwide, and Somalia is no exception. As a country located in the horn of Africa, one of the most climatic-hypothetical areas of the world has seen dried cycles, irregular rain patterns and rising temperatures in the last two decades. These environmental stresses have had a profound impact on pollinators, especially bees, which are important for ecosystem stability and agricultural productivity. In a delicate ecological setting such as Somalia's Dry lands, even slight changes in climatic conditions can trigger a waterfall of disruption in pollination systems.

The bee population in Somalia has emerged longer and recurrent drought as a primary driver of a decline. These reduce the availability of dried water, press the cycles of flowering in native flora, and reduce nectar and pollen sources that rely to survive bees. For example, trees such as acacia, *Acacia tortilis* (locally known as **Qudhac**), *Acacia bussei* or *Acacia seyal* (**Galool**), *Acacia nilotica* (**Gob**), and *Acacia senegal* (**Bilcil**).), which work as major nectar providers, are no longer flowering due to irregular rainfall. It directly affects the forging bee forging beauty, breeding success and overall colony flexibility. In addition, drought -stricken vegetation produces less bloom and less nutritious nectar, making it difficult for bees to maintain its energy levels and immune health.

In addition to floral resource scarcity, droughts also exacerbate habitat degradation. As surface water bodies dry up and vegetation cover recedes, bees are forced to migrate in search of more favorable conditions. However, Somalia's fragmented landscapes and ongoing deforestation limit bees' ability to relocate successfully. Mobile beekeeping practices, once common among nomadic pastoralists, have also declined due to insecurity and the increasing unpredictability of climate. Consequently, many bee colonies either collapse or fail to establish new hives, leading to population declines over time.

The rise in temperature—particularly during the dry **Jilal and Xagaa** seasons—has introduced new thermal stressors that further endanger bee species. Elevated heat levels increase bees' metabolic rates, causing them to dehydrate more quickly and expend more energy during foraging.

These extreme conditions also disrupt their internal navigation systems, impair reproduction, and create unfavorable hive microclimates. Combined with the physiological toll of food scarcity, these heat stressors make it increasingly difficult for pollinators to survive in Somalia's changing environment.

Compounding these challenges is the lack of scientific data and monitoring systems that track the impacts of climate change on local pollinator species. Somalia does not yet have national research institutions dedicated to apiculture or biodiversity conservation, leaving a critical gap in understanding how environmental changes are reshaping pollinator behavior and survival. Without long-term data and predictive models, it is difficult to implement targeted interventions, develop early warning systems, or integrate pollinator protection into climate adaptation policies.

In response to these growing threats, it is imperative for Somalia to incorporate pollinator conservation into its broader climate resilience and environmental sustainability strategies. This includes investing in drought-resilient flora, restoring degraded ecosystems, supporting climate-smart agriculture, and promoting traditional ecological knowledge among local beekeepers. Protecting bees is not merely an environmental issue; it is a socio-economic priority that affects food security, rural livelihoods, and the broader ecological balance. As the impacts of climate change intensify, so too must our commitment to safeguarding the pollinators that sustain life in Somalia's drylands.

2. Deforestation and habitat loss

Widespread deforestation in Somalia, inspired by large -scale charcoal production, urban expansion and unstable agricultural practices, has given rise to erosion and fragmentation of major pollination houses. Indigenous trees such as Acacia, Zizipus (Gob), *Acacia tortilis* (**Qudhac**), *Acacia bussei* or *Acacia seyal* (**Galool**) and Boswelia (franchise), which provide important floral resources and shelters for bees, are lost at dangerous rates. In many rural areas, traditional bee nest hunting sites such as hollow tree tights and shaded thick overheating and land conversion have disappeared.

The destruction of these ecosystems eliminates the base of the nest and disrupts ecological continuity that depends on to maintain healthy colonies on bees. In addition, the disadvantage of the habitat increases the effects of climate change by reducing natural buffers against heat and drought. As the variety of plant declines, the variety and abundance of pollinators -especially native bee species adapted to Somalia's unique dryland ecology.

The absence of forest management and the absence of protected areas for biodiversity conservation makes it difficult to prevent this trend. Without immediate efforts to rehabilitate the natural landscape and resume native vegetation, Somalia's bees face an existential threat with long -term results for both ecosystems and agriculture.

3. Lack of Awareness and Policy Gaps in Protecting bees

A critical, yet underacknowledged, contributor to the decline of pollinators in Somalia is the pervasive lack of public awareness combined with significant policy and institutional gaps. While bees are essential to both ecological balance and agricultural productivity, their value beyond honey production remains poorly understood among the general population, policymakers, and even many in the agricultural sector. In rural communities, where traditional honey gathering was once common, elders now report that wild bees have become increasingly rare, and younger generations have little exposure to beekeeping or its environmental importance.

This knowledge vacuum is exacerbated by the absence of environmental education in Somalia's school curriculum and the lack of targeted awareness campaigns at both community and national levels. Unlike in countries such as Ethiopia or Kenya—where national apiculture strategies, research institutions, and awareness initiatives support pollinator conservation—Somalia has yet to integrate pollinators into its environmental or agricultural development agenda. The country currently lacks legislation regulating pesticide use, preserving native bee habitats, or promoting sustainable land-use practices that are pollinator-friendly.

Institutionally, beekeeping is not prioritized within governmental agricultural extension services, and no centralized data exists on bee population trends or pollinator health. This lack of capacity makes it nearly impossible to assess ecological changes, respond to pollinator losses, or provide farmers and pastoralists with the tools to support sustainable apiculture. Additionally, no coordinated training programs or technical assistance mechanisms exist to build local skills in modern beekeeping, queen rearing, or hive management, especially in rural or nomadic communities.

The policy vacuum further limits international cooperation and funding opportunities. Somalia's inability to articulate national priorities related to pollinators means that global initiatives—such as the FAO's International Pollinator Initiative or UNEP's efforts on biodiversity—struggle to engage with Somali stakeholders. This marginalization in global forums contributes to a cycle of neglect and underinvestment in pollinator conservation.

Addressing these systemic shortcomings requires a multi-tiered response. At the grassroots level, community-based awareness campaigns should be launched to reintroduce the importance of bees as critical components of both ecosystem health and food systems. In parallel, national institutions must develop and implement clear policies that regulate harmful agricultural practices, incentivize pollinator-friendly farming, and protect natural bee habitats. Educational institutions should be mobilized to incorporate pollinator science and conservation into their curricula, while NGOs and international partners should prioritize pollinator research, monitoring, and training programs.

Ultimately, strengthening awareness and creating effective policies for pollinator protection is not just an environmental imperative—it is essential for securing food security, enhancing biodiversity, and sustaining the livelihoods of millions of Somali households that depend on agriculture and pastoralism.

4. Pests and Diseases Affecting Bees in Somalia

Pollinators in Somalia are under increasing threat not only from environmental stressors such as drought and deforestation but also from biological pressures including pests and diseases. These factors, though often overlooked, pose substantial risks to colony health, productivity, and the long-term sustainability of apiculture in the country.

1. Pests as a Major Threat to Bee Colonies

One of the most pressing challenges Somali beekeeper's faces is infestation by destructive pests. **Black ants**, in particular, are widely reported as a serious menace in rural apiculture systems. These ants are highly invasive and capable of infiltrating beehives to feed on nectar, honey, and even bee brood. Their small size enables them to bypass many traditional hive barriers, often leading to complete colony absconding when infestations persist (Musumhi, 2013).

Another major predator is the **honey badger (*Mellivora capensis*)**, a nocturnal mammal capable of destroying multiple hives in a single night. Honey badgers use their acute sense of smell to locate hives and will tear apart hive structures to access honey and larvae. Their destructive behavior is not only economically damaging but also deeply demoralizing for rural beekeepers operating in insecure regions (Musumhi, 2013; Begg, 2012).

Other pests include **wax moths** (*Galleria mellonella*) and **small hive beetles**, which damage hive interiors, consume comb structures, and contaminate honey. These pests thrive in poorly managed hives and can significantly reduce hive productivity. The cumulative impact of these pests leads to weakened colonies, disrupted reproductive cycles, and lower honey yields.

Preventive measures recommended by regional experts include placing hives on elevated platforms or tree branches, applying grease or oil on hive stands to deter ants, and frequent inspection for early pest detection. However, widespread adoption of these practices in Somalia remains limited due to knowledge gaps and lack of resources.

2. The Uncharted Threat of Bee Diseases

Unlike pests, the presence and impact of **bee diseases in Somalia remain largely undocumented**. Across East Africa, diseases such as *Nosema spp.*, *American Foulbrood*, and *Varroa destructor* mites are recognized as threats to bee health, although their severity varies by region. In Somalia, however, there is **no formal disease surveillance system** to detect or monitor such pathogens. This presents a significant knowledge gap that hampers effective colony management and policy response (Kajobe et al., 2010).

Some experts argue that the **lack of reported bee diseases in Somalia may be due to underdiagnosis** rather than absence. Informal beekeeping practices, lack of veterinary oversight, and minimal beekeeper training make it difficult to recognize disease symptoms such as poor brood patterns, colony collapse, or malformed bees.

Without proper diagnostic tools and extension support, beekeepers may attribute disease symptoms to other causes, such as drought or malnutrition.

The **absence of localized data** also prevents Somalia from participating in regional disease mitigation strategies or benefiting from international research on bee health. Furthermore, global trade and migratory beekeeping practices increase the risk of **importing new pathogens**, making the establishment of a national monitoring program even more urgent.

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