# Technical Product for Kenya

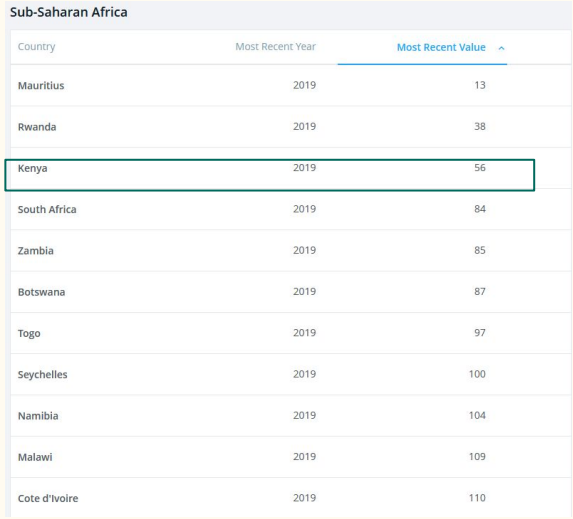
—

Group: ayamien, mkhan119, psethi6, vsanil1

# Drone service

# Country overview:

Ease of doing Business ranking:



Sub-Saharan Africa

| Country | Most Recent Year | Most Recent Value |
|---|---|---|
| Mauritius | 2019 | 13 |
| Rwanda | 2019 | 38 |
| Kenya | 2019 | 56 |
| South Africa | 2019 | 84 |
| Zambia | 2019 | 85 |
| Botswana | 2019 | 87 |
| Togo | 2019 | 97 |
| Seychelles | 2019 | 100 |
| Namibia | 2019 | 104 |
| Malawi | 2019 | 109 |
| Cote d'Ivoire | 2019 | 110 |

https://data.worldbank.org/indicator/IC.BUS.EASE.XQ?end=2019&locations=ZG-RW&most_recent_value_desc=false&start=2019&view=map

Demography:

Kenya has experienced dramatic population growth since the mid-20th century as a result of its high birth rate and its declining mortality rate. Almost 40% of Kenyans are under the age of 15 as of 2020.

Age structure:

**0-14 years:** 38.71% (male 10,412,321/female 10,310,908)

**15-24 years:** 20.45% (male 5,486,641/female 5,460,372)

**25-54 years:** 33.75% (male 9,046,946/female 9,021,207)

**55-64 years:** 4.01% (male 1,053,202/female 1,093,305)

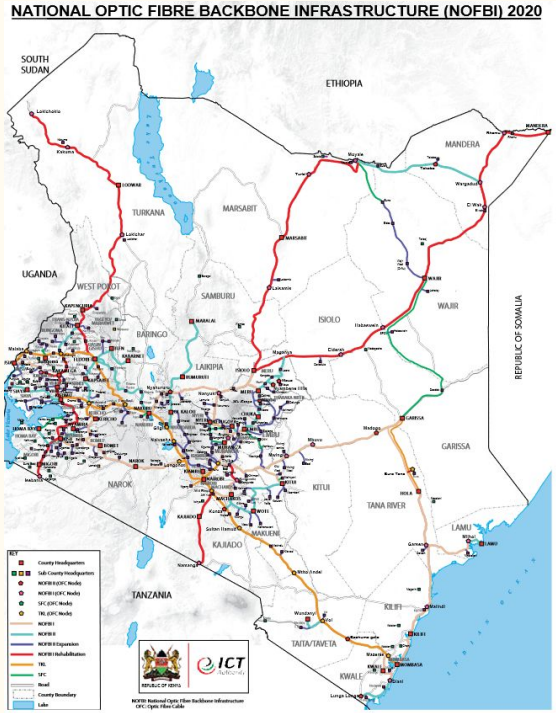
**65 years and over:** 3.07% (male 750,988/female 892,046) (2020 est.)

https://www.cia.gov/the-world-factbook/countries/kenya/#people-and-society

# Country overview:

At the county level, through Nation Optic Fibre Backbone Infrastructure (NOFBI) and County Connectivity Project the Kenya government has implemented 510 km of last mile connectivity in the county headquarters as part of the county metros and last mile connections. The main aim of last mile connectivity is to interconnect all counties with VoIP (county and inter-county communication; voice services) through internet connection (promoting online services using telephones, emails and video conferencing) and access to critical government applications like the Integrated Financial Management Information System (IFMIS).

Reference:https://cms.icta.go.ke/sites/default/files/2022-04/Kenya%20Digital%20Masterplan%202022-2032%20Online%20Version.pdf



# Understanding the market:

Kenya Government is providing subsidies for IoT and Digital services in their The Konza Technopolis master plan, approximately 84 acres in Phase I for establishment of light industrial zone.

Kenya’s urban landscape accounts for only 30% of the total land. Rest of the country is still rural and does not have access to civic amenities the way urban landscape has.

https://www.ict.go.ke/wp-content/uploads/2019/05/Kenya-Digital-Economy-2019.pdf

# Understanding the market:

In April 2022, the government launched its ten-year Digital Masterplan 2022-2032, to align with global technological advancements and enhance the rise of Kenya's digital economy. The digital master plan identifies four key pillars - digital infrastructure, digital services and data management, digital skills, and driving digital innovation for entrepreneurship. Other key priority areas under the masterplan include development of a legal, policy & regulatory framework, research & development, information security & cyber management and emerging technologies.

Kenya's national budget allocations for FY 2022/2023 have seen the government set aside $132 million for ICT initiatives. Specific allocations included: $5.26 million for government shared services; $76 million to fast-track the development of the Konza Technopolis/Smart city, $22.9 million for the last mile connectivity network, $10 million for maintaining and rehabilitating the national optic-fiber backbone NOFBI phase II expansion cable; $11.8 million for installation and commissioning of the Eldoret-Nadapal fiber optic cable and, $2.6 million for the digital literacy program and ICT integration in secondary schools. See here for more information.

The country' National Broadband Strategy 2018 –2023 is aimed at transforming Kenya into a knowledge-based economy through the provision of quality broadband services to all citizens in the country. There are currently four undersea fiber optic cables that land off the coast of Kenya: SEACOM, TEAMS, EASSY, and LION2, which are the core drivers of fixed internet penetration in the country making it one of the highest, fastest, and most reliable in the region. NBS 2023 envisions a Kenya where a user in the remotest part of the country can connect with other users within and outside the country at the click of a button to communicate, transact and interact over a fast, reliable, secure and affordable Internet connection.

https://www.trade.gov/country-commercial-guides/kenya-information-communications-and-technology-ict

# Identified gaps

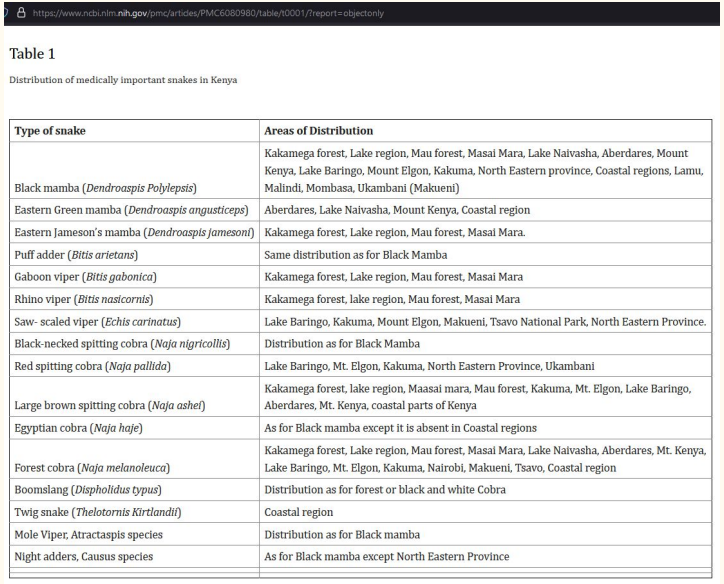
Annually, about **2.7 million snakebite** envenomings occur **worldwide**, primarily affecting those living in rural regions. Effective treatment exists but is scarce, and traditional treatments are commonly used. To inform context-specific policies in Kenya, this study aimed to determine the health-seeking behavior and the health, social, and economic burden of snakebites in rural communities. Nonprobability sampling was used to survey 382 respondents from four snakebite-endemic counties, from February to August 2020, using a structured questionnaire. Descriptive statistics, Fisher's exact tests, binary logistic regressions, and Mantel-Haenszel tests were used for analysis. Life-time experience with snakebites included 13.1% of respondents who reported being personally bitten and 37.4% who reported knowing of a community member being bitten. Respondents reported death after a snakebite in 9.1% of bitten community members and in 14.6% of bitten family members. Risk of snakebite was not significantly associated with sex, educational level, or occupation. Snakebite victims were most often walking (38%) or farming (24%) when bitten. Of those bitten, 58% went to a health facility, 30% sought traditional treatment, and 12% first went to a traditional healer before visiting a facility. Significant differences existed in perceptions on the financial consequences of snakebites among those who had been personally bitten and those who had observed a snakebite. Most commonly mentioned preventive measures were wearing shoes and carrying a light in the dark. Community engagement, including engagement with traditional healers, is needed to reduce snakebites. This should be done through education and sensitization to improve used preventive measures and effective health-seeking behavior.

Reference: https://www.ajtmh.org/view/journals/tpmd/105/3/article-p828.xml

# Identified gaps

Snake bites are a silent public health problem in Kenya.

Snake bites are a neglected emergency in Kenya. This is because there is low awareness of snake bites as a public health problem in the country. Few studies have been carried out to evaluate the magnitude of the problem of snake bites in Kenya. Coombs and co-workers reported the incidence of snake bites in Kakamega and Western Kenya, Lake Baringo and Laikipia, Kilifi and Malindi as well as Northern Kenya to be between 1.9/100,000/year and 67.9/100,000/year . Additionally, they reported that the mortality rate of snake bites in these areas was 0.45/100,000/year . Furthermore, Kihiko reported that snake bites at Kitui District hospital were majorly characterized by compartment syndrome and focal gangrene. Puff adders, black spitting cobras, black mambas and the boomslang have been reported to be behind a majority of the snake bites in Kenya.



https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6080980/table/t0001/?report=objectonly

Table 1

Distribution of medically important snakes in Kenya

| Type of snake | Areas of Distribution |
|---|---|
| Black mamba (*Dendroaspis Polylepsis*) | Kakamega forest, Lake region, Mau forest, Masai Mara, Lake Naivasha, Aberdares, Mount Kenya, Lake Baringo, Mount Elgon, Kakuma, North Eastern province, Coastal regions, Lamu, Malindi, Mombasa, Ukambani (Makueni) |
| Eastern Green mamba (*Dendroaspis angusticeps*) | Aberdares, Lake Naivasha, Mount Kenya, Coastal region |
| Eastern Jameson's mamba (*Dendroaspis Jamesoni*) | Kakamega forest, Lake region, Mau forest, Masai Mara. |
| Puff adder (*Bitis arietans*) | Same distribution as for Black Mamba |
| Gaboon viper (*Bitis gabonica*) | Kakamega forest, Lake region, Mau forest, Masai Mara |
| Rhino viper (*Bitis nasicornis*) | Kakamega forest, lake region, Mau forest, Masai Mara |
| Saw- scaled viper (*Echis carinatus*) | Lake Baringo, Kakuma, Mount Elgon, Makueni, Tsavo National Park, North Eastern Province. |
| Black-necked spitting cobra (*Naja nigricollis*) | Distribution as for Black Mamba |
| Red spitting cobra (*Naja pallida*) | Lake Baringo, Mt. Elgon, Kakuma, North Eastern Province, Ukambani |
| Large brown spitting cobra (*Naja ashei*) | Kakamega forest, lake region, Maasai mara, Mau forest, Kakuma, Mt. Elgon, Lake Baringo, Aberdares, Mt. Kenya, coastal parts of Kenya |
| Egyptian cobra (*Naja haje*) | As for Black mamba except it is absent in Coastal regions |
| Forest cobra (*Naja melanoleuca*) | Kakamega forest, Lake region, Mau forest, Masai Mara, Lake Naivasha, Aberdares, Mt. Kenya, Lake Baringo, Mt. Elgon, Kakuma, Nairobi, Makueni, Tsavo, Coastal region |
| Boomslang (*Dispholidus typus*) | Distribution as for forest or black and white Cobra |
| Twig snake (*Thelotornis Kirtlandii*) | Coastal region |
| Mole Viper, Atractaspis species | Distribution as for Black mamba |
| Night adders, Causus species | As for Black mamba except North Eastern Province |

Table 1 Reference: BIO-KEN SNAKE FARM & LABORATORY

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6080980/

Coombs MD, Dunachie SJ, Brooker S, Haynes J, Church J, Warrell DA. Snake bites in Kenya: a preliminary survey of four areas. Trans R Soc Trop Med Hyg. 1997;91(3):319–321.

# What technical product would address gaps

Medapp is developed to seek assistance and request delivery of a antivenom using drone.

- User registration and login: Users can create an account on the app by providing their personal information, including name, address, and contact details. The user's location can also be tracked using GPS.
- Emergency button: The app could have an emergency button that can be pressed in case of an emergency, which will immediately notify the app's emergency response team.
- Drone delivery: Once the product request is submitted, the app can initiate the drone delivery process. The user's location can be used to guide the drone to the delivery location.

Overall, Medapp is user-friendly app, simple to navigate, and have a clear interface that enables customers to immediately seek the support they need and get timely assistance.

# What technical product would address gaps

If the populace is aware of the potential advantages of drone-delivered anti-venom, and if they have a higher level of trust in the technology, they may be more inclined to employ the service. Additionally, if individuals have limited access to medical facilities or experience other hurdles to obtaining treatment, the simplicity and quickness of drone-delivered anti-venom might be very beneficial.

# How would the technical product be delivered

Antivenom may be supplied to persons afflicted by snake bites through drones by placing the vials of antivenom into a specially designed container, which is then linked to the drone. The drone then flies to the site of the bite sufferer and dumps the container containing the antivenom at a preset point.

# How would the technical product be delivered

Lightweight drones will deliver Antivenom packages to clinics or to the victim up to 85 kilometres, trips that might have taken an entire day by car could take 30 minutes or less by drone.

It will be delivered to hospitals and health facilities, whenever they need them instantly.

We will also work closely with International Civil Aviation Organization (ICAO) and Kenyan Civil Aviation Authority to ensure safety and compliance with local regulations.

The partnership with them presents a unique opportunity to reduce delivery times and increase accessibility to healthcare and other industries that may support drone logistics into the future.

We will also coordinate with Zipline- instant logistic leader in Kenya to increase our services and make it possible to reach out to every household.

# Challenges

- Poor Infrastructure. (Internet access is somewhat limited by poor infrastructure, but penetration rates and connection speeds continue to improve. According to DataReportal's Digital 2022 report, Kenya's internet penetration rate was 42 percent as of January 2022.
- Corruption
- Weak Governance (Kenya has had failed Government Initiatives in the past)


# Challenges

- Weakened Consumer Spending
- Lower Public Investment

Thank you for listening!