Research Article

# Monkey menace in Kwa Vonza/ Yatta Ward, Kitui County, Kenya: Threat to food and nutrition security and sustainable livelihoods

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## Abstract

Since time immemorial, farmers in the arid and semi-arid lands in Kitui County have had many challenges in attaining food and nutrition security. This is largely attributed to inadequate rains, crop diseases, pests, and crop damage by wild animals among others factors. However, the monkey menace and its threats to food security and sustainable livelihoods in Kitui County are not documented. On this basis, a socio-economic survey was carried out in Kwa Vonza/Yatta ward, Kitui Rural constituency in Kitui County to establish i) the extent of damage by monkeys in the ecosystems ii) socio-economic impacts caused by monkeys iii) mitigation measures employed to control the monkey menace in Kitui rural constituency. The socio-economic survey, using one hundred and fifty (150) respondents, revealed that 65% of the respondents indicated that the monkey menace was a threat to food security, and human and livestock life. The respondents noted that monkeys damage their crops (cereals, fruits, and vegetables) on the farm, kill kids of goats and lambs of sheep, and damage food in stores and kitchens. In extreme cases of dry spells, 25% of the respondents indicated the monkeys caused physical injuries to children when the monkeys are looking for food in their homesteads. The respondents felt that the government, through Kenya wildlife services, should intervene to control the monkey population in the hilly habitats for the farmers to have gainful agricultural production and sustainable livelihoods.

## Introduction

Since time immemorial, the agro-pastoralist farmers in Kitui County have been growing crops, like local maize, beans, cowpeas, sorghum, and millet [1]. Over the years, there have been crop dynamics depending on the influence of climate, farmers' skills and experience, and the prevalence of disease and pests. In the recent two decades, the farmers have adopted highly valued crops hybrid maize varieties, grafted mangoes, bananas, and green grams [1]. However, crops like sorghum and millet (both finger millet and pearl millet) have been orphaned due to birds' damage and societal perception that these crops are of the poor. In addition, the farmers rear livestock mainly cattle (mainly the local breeds and some improved breeds, like Friesians and Jersey), local goats, sheep, and poultry (mainly local chicken breeds) to utilize the non-edible materials in their lands for subsistence and commercial purposes under free-range and semi-intensive systems [2] Figure 1.

Mutavi [3] noted that, in the recent past, the farmers in arid and semi-lands (ASALs) in Kitui County have been embracing improved technologies and practices to increase their agricultural production and remain resilient. On this basis, fruit and vegetable farming has become common among many of these farmers. Grafted mangoes, pawpaws, and bananas have been introduced by farmers for income generation, food, and nutrition security (KCIDP, 2013-2017). In addition, vegetables (tomatoes and Kales – sukuma wiki) are being grown especially under irrigation by farmers with boreholes, and water pans and by those farmers close to seasonal rivers or through kitchen gardening – where improvised technologies are used. These include the use of old tires, plastic bottles, and hydroponics among the informed farmers. In addition, the farmers are using tethering systems or intensive systems to rear improved poultry and dairy cattle breeds on small-sized farms [2].

It is important to note that agriculture remains a key source of food, income, and livelihood in the ASALs in Kitui
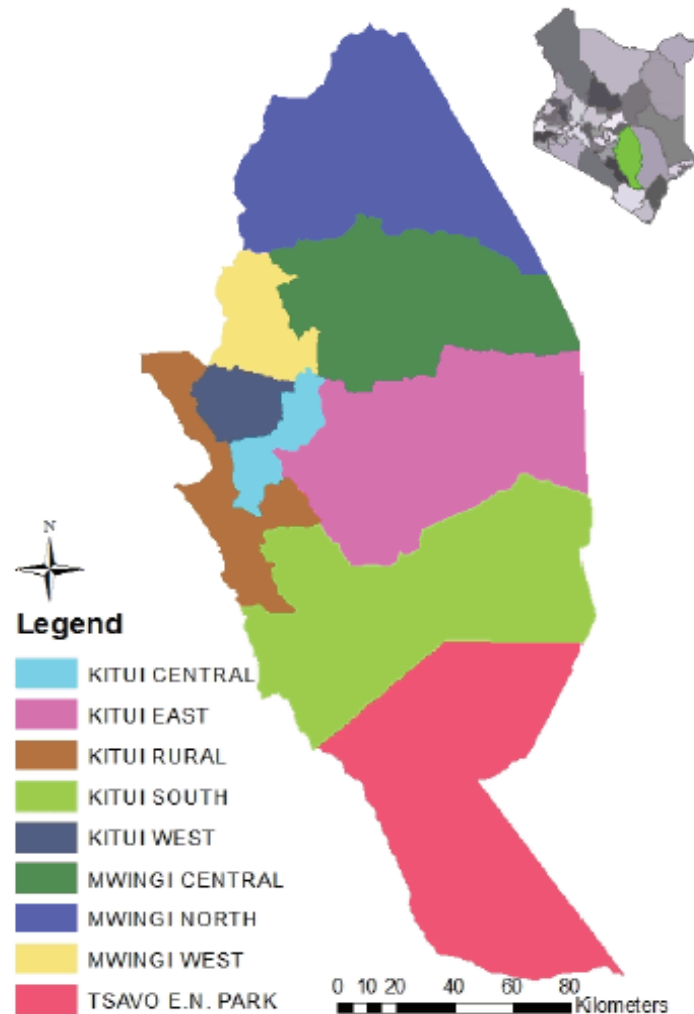
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**Figure 1:** Kitui County.

County where other forms of occupation remain scanty. Therefore, these agro-pastoralist farmers in these ASALs have continued to grow crops and rear animals faced with a myriad of challenges. This is largely attributed to inadequate rainfall received and the occurrence of diseases and pests that attack and damage crops on farms and in stores after harvesting.

However, in order for the crop and livestock yield to remain high, challenges faced by these farmers need mitigation. For example, farmers, through their experience, have adopted ways to control crop and livestock diseases and pests. This includes planting drought-resistant crop varieties and rearing hard breeds of livestock. Further, in conjunction with extension officers, the farmers use recommended chemicals to control the diseases and pests on their farms. In all these endeavors, the farmers realize good crop yields and livestock products. However, many times their yields are affected by the monkey menace on their farms or in their stores Figure 2.

Sharma, et al. [4]. Noted that the monkey problem remains a problem globally causing 90% of damage in agricultural and horticultural production in India. It is hypothesized that the monkey menace is prevalent in Kenya and more so, in Kwa Vonza/Yatta ward, Kitui County. However, little is known about the prevalence of the monkey menace and its effects on agricultural production and the sustainability of livelihoods in the Kwa Vonza/Yatta ward in Kitui County. It is on this basis that the researcher identified the research gap and designed this research to establish the extent of crop damage by monkeys, socio-economic impacts, and mitigation measures used by agro-pastoralists in the Kwa Vonza/Yatta ward in Kitui County.

## Methods and materials

### Study area

This study was carried out in Kwa Vonza/Yatta ward in the Kitui Rural constituency, where agricultural production remains key economic activity for sustaining the livelihoods of the agro-pastoralist Kamba community [1]. According to MOLDF [2] and Jaetzold, et al. [5], Kwa Vonza/Yatta ward has a semi-arid climate with annual rainfall between 500 -1050mm with 40% reliability occurring in two spots of rain seasons (short rain in October – December and long rains in March-May). In addition, the Kwa Vonza/Yatta ward has a combination

**Figure 2:** Monkeys in agricultural lands: Source /KNA [14].

of sandy, loamy soils and patches of black cotton soils, stony and rocky soils, and hilly terrain with busy *Acacia / Commiphora* vegetation and sparse human population on the lowlands and hills sides of the habitats [5]. Further, it has riverine vegetation along the seasonal Tiva and Mwitasyano rivers that transverses on the eastern and western sides of Kwa Vonza/Yatta ward respectively. This forms a suitable habitat for wild animals, like snakes, monkeys, guinea fowls, dik-diks, etc. These wild animals are bound to destroy crops, attack livestock, injure humans and create fear among the residents of Kwa Vonza/ Yatta ward in Kitui Rural Constituency.

## Survey hypotheses and design

The study hypothesized that the monkey menace was common and a significant threat to food and nutrition security and sustainability of livelihoods in Kwa Vonza/Yatta ward, Kitui County. This necessitated the study to be carried out using a socio-economic survey to:

i) Establish the prevalence of monkey menace in the Kwa Vonza/Yatta ward;

ii) Establish the socio-economic impacts caused by the monkey's menace;

iii) Evaluate the mitigation measures employed to control the monkey menace in Kwa Vonza/Yatta, Kitui Rural constituency.

The socio-economic survey design was used to collect data/ information in the study area on the farmers' perceptions of the marauding monkeys and whether the monkey menace was a significant threat to food and nutrition security and the sustainability of livelihoods. A semi-structured questionnaire was designed, piloted on validity and reliability, and purposely used to collect data from randomly selected one hundred and fifty respondents (150) in Mikuyuni and Tanganyika sub-locations, Kwa Vonza location in Kwa Vonza/Yatta ward in January-February 2022. The sample size of 150 was deemed suitable to give statistical information on the variables under investigation in line with Mugenda and Mugenda [6]. The authors observed that statistical information can be obtained from research work provided that the sample size of thirty

(30). Then, the research tools were cleaned and data analyzed using SPSS 21 and excel software to determine the extent of the monkey menace, and the socio-economic impacts of the monkey problem on food security and livelihood sustainability. In addition, mitigation measures used to control the monkey menace were also sought. The results were calculated using descriptive statistics and compared the significant differences between the variables at a 95% confidence interval.

## Justification of the study

The study sought to establish the prevalence of the monkey menace and its threat to food and nutrition security and the sustainability of livelihoods. Further, it sought to establish mitigation measures used in controlling the marauding monkeys in the study area. The information will be helpful in formulating policies and strategies for controlling the monkey problem in Kwa Vonza/Yatta ward, Kitui County, and in Kenya in general. This will reduce the risks associated with agricultural damage from monkeys. This will improve agricultural production and the residents will attain food and nutrition security. In addition, residents will have decency in life and sustainable livelihoods and human-wildlife conflicts will be greatly reduced.

## Results and discussion

### Results

The results were drawn from the responses from the socio-economic survey in the Kwa Vonza/Yatta ward, Kitui Rural constituency in Kitui County.

The study revealed that the households were male-dominated (63.3%) and transgender cases were not reported (Table 1). In addition, female-headed households had a substantial proportion (36.7%). This included widows and single mothers - who have never been married and those others that have separated from their husbands Table 2.

The study revealed that the majority (56.7%) of farmers were mature and productive. In addition, a substantial proportion (26.7%) of the farmers were old and were probably retired employees or farmers who had gained experience in commercial farming.

**Table 1:** Gender of the Farmers (n = 150).

| Gender of the Farmers | Frequency | % |
|---|---|---|
| Male | 95 | 63.3 |
| Female | 55 | 36.7 |
| Transgender | 0 | 0.0 |
| **Total** | **150** | **100.0** |

**Table 2:** Age of the Farmers (n = 150).

| Age of the Farmers | Frequency | % |
|---|---|---|
| >18 - 35 yrs | 25 | 16.7 |
| >35 - 60 yrs | 85 | 56.7 |
| > 60 yrs | 40 | 26.7 |
| **Total** | **150** | **100.0** |

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The study revealed that the monkey menace was prevalent (64.7%) in Kwa Vonza/Yatta ward and it was a significant problem affecting farming at P<05 (Table 3). This implies that farming output was greatly affected by the monkeys, through the destruction of crops in the field or in store, killing livestock, or simply creating fear among the farming households in the study area. This is a real threat to food and nutrition security and sustainable livelihoods in Kwa Vonza/Yatta ward, Kitui County.

The monkeys were majorly (69.3%) found in the hilly areas of the study area (Table 4). The habitation of monkeys in the hilly areas was significant compared to the substantial number (26.0%) of the monkeys found in the riverine ecosystems and the insignificant habitation (4.7%) in lowlands in the two sub-locations in the Kwa Vonza/Yatta ward. This implies that the monkey problem greatly affected the households in the hilly areas and substantially in areas near the riverine ecosystems.

The study revealed that the monkeys significantly live in groups (99.3%) and the groups majorly move in the morning (74.7%) and at times in the afternoon (20.0%) in search of food and water (Table 5). In addition, the study revealed further that troops/groups of monkeys are majorly risky (56.0%) or very risky (18.7%) when confronted or being chased from a source of food or from one habitat to the other. However, as indicated by the study findings, the monkeys are not risky at night as they retire to their ecological niches in their habitats and don't move at night.

The study revealed that the common diets for monkeys are wild fruits (42.0%) in the wilderness and crops (28.7%) in cultivated areas (Table 6). The farmers felt that in highly cultivated areas the monkeys fed on both (29.3%) wild fruits and crops in the farmlands. Further, the monkeys fed on varied wild fruits depending on season and time of the year, with *Tamarindus indica* fruits, locally known as Ngwasu (42.7%) being the preferred wild fruits among others (Table 6).

The study revealed that the monkeys were a major problem to the crop farmers in the research area. The monkeys affected the production of a variety of crops - cereals, fruit and vegetable crops, and industrial and root crops (Table 7). The monkey menace significantly affected the production of maize and mango production (Table 7), which the farmers felt that it was a threat to food and nutrition security and sustainable livelihoods. In addition, the study revealed that the production of green grams, bananas, cassava, sweet potatoes, and cotton was substantially affected by the monkey menace in the Kwa Vonza/Yatta ward. The farmers lamented that the monkey problem frustrated their efforts to do crop diversification to

**Table 4:** Habitat for the Monkeys.

| Type of Habitat | Frequency | % | P < 05 |
|---|---|---|---|
| Hilltops | 104 | 69.3 | 0.003* |
| Riverine | 39 | 26.0 | |
| Lowlands | 7 | 4.7 | |
| Total | 150 | 100.0 | |

* Significant at P < 05

**Table 5:** Monkey Behaviour, Risk, and Time of damage.

| Do Monkey live in Groups | Frequency | Percent | P < 05 |
|---|---|---|---|
| Yes | 149 | 99.3 | 0.000* |
| No | 1 | .7 | |
| Total | 150 | 100.0 | |
| **Are Monkey Risky** | **Frequency** | **Percent** | **P < 05** |
| Not Risky | 38 | 25.3 | 0.007* |
| Risky | 84 | 56.0 | |
| Very Risky | 28 | 18.7 | |
| Total | 150 | 100.0 | |
| **Time of Risk / Damage** | **Frequency** | **Percent** | **P < 05** |
| Morning (6.00 am -12.00pm) | 112 | 74.7 | 0.001* |
| Afternoon(12.00pm− .600pm) | 30 | 20.0 | |
| Evening (6.00pm-9.00pm) | 8 | 5.3 | |
| Night (9.00pm − 6.00am) | 0 | 0.0 | |
| Total | 150 | 100.0 | |

*Significant at P < 05

**Table 6:** Monkey Diet and Type of Wild fruits fed.

| Common Diet | Frequency | Percent | P < 05 |
|---|---|---|---|
| Wild Fruits | 63 | 42.0 | 0.756** |
| Crops | 43 | 28.7 | |
| Both | 44 | 29.3 | |
| Total | 150 | 100.0 | |
| **Type of wild fruits** | **Frequency** | **Percent** | **P < 05** |
| Ngwasu (Tamarind spp) | 64 | 42.7 | 0.078** |
| Ndului (Balanites spp) | 37 | 24.7 | |
| Ngaa | 39 | 26.0 | |
| Masembe | 10 | 0.7 | |
| Total | 150 | 100.0 | |

**Insignificant at P < 05

attain food security and sustainable livelihoods. Further, a substantial number (12.0%) of the farmers were not aware that monkeys destroy cotton and sugar cane among other industrial crops (Table 7).

The study revealed that monkey destruction is of concern to the farmers as 40% of the farmers expressed that more than 40% of farm produce is severely destroyed (Table 8). In addition, 12% of the farmers, especially those bordering the monkey habitats, lamented that more the 70% of their produce is destroyed by monkeys at times. This implies that

**Table 3:** Monkey Menace (n = 150).

| Monkey problem | Frequency | % | P < 05 |
|---|---|---|---|
| Farmers facing the monkey menace | 97 | 64.7 | 0.001* |
| Farmers not facing the monkey menace | 53 | 35.3 | |
| Total | 150 | 100 | |

* Significant at P < 05

the monkey problem in Kwa Vonza/Yatta ward is a real threat to food security and a danger to the realization of sustainable livelihoods.

The study also sought to find out whether the monkey menace is a threat to the livestock sector and man and the results are as shown below.

The study revealed that the monkey problem was a danger to the livestock sector. Monkeys commonly attacked the small-sized livestock (goats' kids, sheep' lambs, and chicken) being kept by the small-scale households for livelihood sustainability, with goats production significantly being affected (Table 9). In other cases, the monkeys were found to attack men (especially women and children at home and on farms) and hunting dogs that are tethered by the farmers on their farms to scare away the marauding monkeys. This created fear among most farmers as they felt that their children left at home were at risk of being attacked by the monkeys. Hence, for security purposes, an adult person manned each homestead, especially those that had young children. The farmers felt that this is a burden, especially during the prolonged dry season when the troops of monkeys frequently visit their farmlands or homes. This greatly affected organization of their household and economic activities especially in monkey-prone areas (hillside homes and those near the riverine ecosystems).

The study also sought to find out the action and measures taken by the farmers in order to manage the monkey problem in the study area and the results as the shown table below.

The study revealed that nearly half (48.0%) of the farmers report cases of monkey problems to the government (Table 10). This is because the farmers are aware that monkeys are part of wildlife in Kenya and it is managed by the government through Kenya Wildlife Services (KWS). In addition, the study revealed that the government involvement in the control of the monkeys or compensating the victim for loss of life, physical injuries, or crop damage was significantly poor (Table 10). This could have been a reason for the substantial number of the farmers not reporting the cases of the monkey problem to the government. This probably prompted the farmers to use varied methods, like fencing, cow dung burning, and use of catapults among others, to control the monkey menace (Table 10). However, none of the methods was significant or universally used by the farmers to control the marauding monkeys in the study area (Table 10).

The study further sought to find out the mitigation measures the farmers anticipated the government to use to control the monkey menace and the results are tabulated below.

The study revealed that the farmers identified several methods aimed at compensating the victims or controlling the monkey menace. Financial support to compensate the victim was identified as a good measure (Table 11). However, the farmers lamented that the financial compensation is only promissory as it doesn't occur or is mostly delayed or takes longer for the victim to be compensated. In order to have a permanent solution to the monkey menace, a substantial number of the farmers were of the view that other measures,

**Table 7:** Crops destroyed by Monkeys (n = 150).

| Cereals Crops | Frequency | Percent | P < 05 |
|---|---|---|---|
| Maize | 85 | 56.7 | 0.002* |
| Beans | 15 | 10.0 | |
| Cowpeas | 15 | 10.0 | |
| Green Grams | 35 | 23.3 | |
| **Total** | **150** | **100.0** | |
| **Fruit /Vegetable Crop** | **Frequency** | **Percent** | **P < 05** |
| Mangoes | 77 | 51.7 | 0.001* |
| Guavas | 4 | 2.7 | |
| Pawpaw | 24 | 16.0 | |
| Bananas | 32 | 21.3 | |
| Tomatoes | 13 | 8.7 | |
| **Total** | **150** | **100.0** | |
| **Industrial Crop** | **Frequency** | **Percent** | **P < 05** |
| Cotton | 44 | 29.3 | 0.564** |
| Sugar Cane | 15 | 10.0 | |
| Others | 12 | 8.0 | |
| I Don't Know | 79 | 52.7 | |
| **Total** | **150** | **100.0** | |
| **Root Crops** | **Frequency** | **Percent** | **P < 05** |
| Cassava | 70 | 46.7 | 0.822** |
| Sweet Potatoes | 62 | 41.3 | |
| Arrow Roots | 0 | 0.0 | |
| I Don't Know | 18 | 12.0 | |
| **Total** | **150** | **100.0** | |

*S = Significant at P < 05

*Significant; **Insignificant at P < 05

**Table 8:** Farmers' Perception of the Extent of Crop Damage by Monkeys.

| Farmers Score | Frequency | Percent | Rank of Damage |
|---|---|---|---|
| < 10% | 52 | 34.7 | Low |
| >10-40% | 38 | 25.3 | Severe |
| >40 -70% | 42 | 28.0 | Very Severe |
| >70% | 18 | 12.0 | Highly destructive |
| **Total** | **150** | **100.0** | **100.0** |

**Table 9:** Livestock attacked by Monkeys.

| Type of Animal attacked | Frequency | Percent | P < 05 |
|---|---|---|---|
| Goats' Kids | 82 | 54.7 | 0.002* |
| Sheep' Lambs | 21 | 14.0 | |
| Poultry | 11 | 7.3 | |
| Others (Man, Dogs) | 36 | 24.0 | |
| **Total** | **150** | **100.0** | |

*Significant at P < 05

like installing an electric fence (40.0%) or relocating the monkeys (30.0%) can be used. However, a small proportion (6.7%) of the farmers felt that the monkey population can be wiped out by killing the money through poisoning.

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**Table 10:** Action taken by Farmers and Response by Govt.

| Reporting done to Govt (KWS/Chief) | Frequency | Percent | P < 05 |
|---|---|---|---|
| Yes | 72 | 48.0 | 0.978** |
| No | 78 | 52.0 | |
| **Total** | **150** | **100.0** | **100.0** |
| **Response and Involvement by Govt** | **Frequency** | **Percent** | **P < 05** |
| Poor | 95 | 63.3 | 0.004* |
| Fair | 50 | 33.3 | |
| Good | 5 | 3.3 | |
| **Total** | **150** | **100.0** | |
| **Methods to control** | **Frequency** | **Percent** | **P < 05** |
| Fencing | 15 | 10.0 | 0.087** |
| Cow dung burning | 09 | 6.0 | |
| Pili Pili balls | 24 | 16.0 | |
| Catapults | 51 | 34.0 | |
| Use of Scarecrows | 27 | 18.0 | |
| Hunting dogs | 24 | 16.0 | |
| **Total** | **150** | **100.0** | **100.0** |

*Significant; **Insignificant at P < 05

**Table 11:** Mitigation measures identified by farmers to control the Monkey problem.

| Mitigation measures requested | Frequency | Percent | P < 05 |
|---|---|---|---|
| Financial Compensation | 35 | 23.3 | 0.698** |
| Electric fencing | 60 | 40.0 | |
| Relocation of the monkeys | 45 | 30.0 | |
| Kill the Monkeys | 10 | 6.7 | |
| **Total** | **150** | **100.0** | |

** Insignificant at P < 05

## Discussion

The human population has been increasing in recent decades in many habitats in Africa [7]. This is consequential - encroachment of wildlife ecosystem by man for human settlement, depletion of forest resources, and conversion of forest land into agricultural lands. This causes human-wildlife conflict in both arable and arid areas in the world. Human-wildlife conflict occurs when the needs and behavior of wildlife impacts negatively on the goals of humans or when goals of human negatively impact the needs of the wildlife. According to Mukeka [8], human-wildlife conflict is common in dry regions and has been recurring problem in Africa. This is a major concern of nations in the world as it affects human and livestock life, food security and sustainability of livelihoods.

Literature review indicates that human-wildlife conflict can be caused by different wild animals in ecosystems. Jayson [9] noted that several species like elephants, wild pigs, porcupine and squirrels causes great crop damage in Kerara in India. Mukeka [8] further noted that elephant causes greatest crop depredation especially maize in areas close to the protected areas in Tsavo, Kenya. Further, Wanyingi [10] noted that elephants are problematic in Shimba hills in Kwale County.

Nyaga, et al. [11]. Observed that human-wildlife conflict can be caused by the naked mole rat that destroys crops in the fields and even in stores in Embu County, Kenya. In addition, Alelign and Yonas [7] observed that human –wildlife conflict can result from monkey problem in agricultural areas as it observed in the highlands in Ethiopia. According to Alelign and Yonas [7], farmers convert primate lands (both indigenous and introduced forests) into agricultural lands. This creates potential for conflict between the hungry monkeys and local farmers. For example, Alelign and Yonas [7] noted that monkeys are forced to become crop raiders in Ethiopian highlands by man encroaching the primate lands. This has caused human-wildlife conflict as crop depredation, loss of livestock and human life and damage of property. According to Uddin, et al. [12], crop damage by wild animals is main source of human-monkey conflict in Bangladesh. Similarly Das and Mandal [13] found out monkeys are major source of human-wildlife conflict in India. This concurs with current research findings that in Kwa Vonza/Yatta ward monkeys causes severe crop damage. This is attributed to the fact that in Kwa Vonza/Yatta ward, crop production is a major economic activity and monkey habitation is common in the hilly areas of the study area. This frequently results into human-monkey conflict – where farmers revealed that the marauding groups of monkeys were risky and caused crop depredation upto 70% loss at times in the study area. This affects food security and sustainability of livelihoods in Kwa Vonza/Yatta ward in Kitui County. This implies that the households need to purchase food to meet their dietary requirements and, thus, their source of income and sustainability of livelihoods is greatly impaired.

Monkey menace greatly affects production of varied crops in both high potential and ASALs in Kenya. According to KNA) [14], monkeys in Murang'a County, found in high potential area, were reported to have destroyed maize, mangoes, beans, bananas and macadamia among other crops. In addition, Sharma, et al. [4] noted that monkeys destroy cereals (maize among others), fruits, like mangoes, guavas, grapes, citrus fruits and plums. KNA [15] reported that monkey menace caused cotton damage in Rarieda sub-county in western Kenya. This concurs with the current research findings where cereals (maize, beans and green grams), fruits (mangoes and bananas) and root crops (cassava and sweet potatoes) were damaged by troops of monkeys in the study area. This crop damage affects crop diversification aimed at reducing risks of crop failure. This further affects attainment of nutrition security as households do not have access to variety of crop produce for balanced nutrients supply. This implies that most households suffers from 'hidden hunger' as they cannot get some nutrients in their diets that they need to have access to in their daily life.

Sharma, et al. [4]. Also noted the crop damage by the monkeys occurs in early morning and evenings. This is when the troops of monkeys frequently visits the farm when the temperatures are moderate. According to Butynski and de Jong [15], monkeys have large home range and can be destructive over large areas as they search for food. In the dry season, the monkeys poses more danger as the monkeys moves over long distances in search of water from human-made water sources

(water tanks, water troughs and dams placed for livestock) in the ecosystems. This concurs with current research findings that the troops of monkeys are problematic mostly in the morning in the expansive semi-arid Kwa Vonza/Yatta ward in Kitui County in search of food and water especially during the dry spells or periods of drought.

Monkeys are omnivorous animals. According to Sharma, et al. [4], monkeys feeds mainly on native fruits, crops produce, eggs of birds and lizards. In addition, KWS [17] noted that monkeys have cooperative behavior and opportunistic feeding lifestyle while KNA [15] reported that monkeys attacks the elderly and young children in Murang'a County. This agrees with current research findings that, through cooperative and opportunistic behavior, monkey physically injure humans and feeds on livestock like kids, lambs and chicken found in the study area. The farmers felt that monkey menace is a real threat to human life, livestock production and attainment of livelihoods sustainability in the study area.

According to Sharma, et al. [4], control of monkey menace is complex and requires coordinated efforts from stakeholders. In Kenya, this includes the farmers, agricultural extension officers, security agencies, KWS and forest officers. In addition, Chauhan and Pirta [18] noted that better understanding of perceptions of local people towards wildlife to control monkey menace and management and conservation of monkeys is very crucial. The government, through KWS, has used financial compensation for wildlife damage to prevent antagonistic relationship between local people and wild animals. However, as reported by KNA [15], KWS doesn't compensate any crop damage from monkeys as KWS degazetted financial compensation for damage from monkeys since 2019. This concurs with the current research findings that no financial compensation has been done for affected farmers in the study area in the recent past. The farmers felt that this was unfair as crop damage from elephants is compensated while crop damage from monkey menace is not, despite it causing 70% economic loss in some cases.

Sharma, et al. [4]. Noted that there are several integrated and traditional methods of control the monkey menace. The integrated approach includes: farming crops, like ginger and lemons, not damaged by monkeys; beekeeping on the edges; planting wild fruits in the forests and installing technological interventions, like electric and solar fencing, laser guided alarms among others. The traditional ways includes: labourers guarding farms; use of guard dogs; use of biophysical barriers; use of toy snakes and scarecrows (scaring noises from tins, iron sheets and reflective ribbons) and use of offensive chemicals among others. This concurs with current research findings that traditional methods (burning of cowdung, pili pili chilli and guard dogs) of combating monkey menace were used by the local farmers. However, the farmers felt that these traditional methods were not effective in combating the problematic monkeys in Kwa Vonza/Yatta ward in Kitui County. In addition, the farmers thought that government involvement in managing the monkey problem was required. This could include relocating of monkeys and installing electric fencing

in monkey habitat. It is important to note that killing of the monkeys is not a remedial option as it will reduce the animal diversity. Secondly, according to the Butynski, and de Jong, (2014), the Kamba community doesn't eat monkey meat like Teso and Turkana communities in western Kenya. This is in agreement with the finding that the Kamba respondents within the study area never fed on the carcass of monkeys killed.

## Conclusion

- Monkey menace has become a threat to food and nutrition security and realization of sustainability of livelihoods in Kwa Vonza/Yatta ward, Kitui County.

- Coordinated efforts from all stakeholders in Kwa Vonza/Yatta ward are required to control the monkey menace especially local people to feel recognized by the government.

- Government involvement in managing human-wildlife conflict need to be done without bias among the areas of occurrence for communities to feel accommodate by the government of the day.

- In order to have effective control of the monkey menace, local people need to be educated on traditional and integrated interventions to improve their perception about monkeys, without antagonistic relationship between the wild animals and man.

## Acknowledgement

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