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Study on Human Wildlife Conflict and Its Impact on The Livelihood of Rural Communities of Andhra Pradesh, India

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Article History	Abstract
	The escalating human-wildlife conflicts in rural communities, driven by expanding human populations encroaching upon natural habits, pose significant risks to both human safety and livelihoods as highlighted in the WWF Magazine 's Spring Issue (2023). These conflicts result from differing perspectives on resolution, leading to tensions among various groups and causing a reduction in territory, natural resources, fatalities, injuries and habitat destruction for both humans and wildlife. Unfortunately, some rare and endangered species face the threat of extinction due to human action taken to prevent future conflicts, emphasizing the urgent need to address this issue. Philip J. Nyhus (2016) suggests that a range of social and psychological factors, including cultural backgrounds, emotional connections, economic considerations governance structures and stakeholder involvement influence people's interaction with wildlife. Based on the data obtained from various sources around2020-23, the number of animal and financial losses was estimated. Most of the damage is caused in Srikakulam, Vizianagaram, Parvathipuram, and Eluru districts where most of the HWC occurs mainly due to elephant attacks (Elephas spp), along with monkeys (Maccacca spp), wild Boar (Sus spp), Snakes like (Naja naja, Krait, Bungarus spp) Mice, Mouse, Rat spp., Jackles (Canis spp), Tiger (Tigris spp) which is amounting to almost 22% of the livestock loss domesticated by farmers. The domesticated animals which were mostly eaten by the predators are Fishes, (Catla, Labeo,Cirhinus spp.) Birds (Gallus, Chittagong, Aseel spp.) goats (Capra spp.), sheep (Ovis spp,) Cows (Bos spp.), pigs (Sus), Buffalo (Bubalus spp.), etc. Altogether substantial amount of monetary loss has occurred. The public and government officials in combined action can mitigate these problems from future attacks. To address this issue, effective management strategies are needed that balance the needs of both humans and wildlife while minimizing the risk of conflict.

1. Introduction

Wildlife survival has alarming signals all over the world as human encroachment, is growing at a fast pace leaving no option for the wild animals except to have conflict with the humans for them to live in this world. Human-wildlife conflict is a pervasive issue that occurs in various situations and is specific regarding habitat, geographical location, vegetation, and climate. Thirgood (2005) classified the types of human-wildlife conflict into five categories: crop raiding, predation upon game species, predation upon livestock, human attacks, and disease transmission. However, other authors also include human injuries and property damages as types of human-wildlife conflict.

Human-wildlife conflict has been present since the inception of agriculture worldwide. Several reports have documented its prevalence globally, and the conflict has resulted in substantial damage to crop and livestock production (WWF, 2021). Some wildlife species responsible for the damages are often referred to as pests. The monetary losses incurred from the different types of damages dependon the type and intensity of the loss Dickman, A. J. (2010).

Ungulates are commonly found grazing in cropland areas that border forests, and their primary diet consists mainly of soybeans and cereals. Bears on the other hand display a particular fondness for targeting sugarcane crops during crop raids, whereas elephants also share this preference for sugarcane and bamboo when it comes to their choice.

In both the African and Asian continents, the natural habitats of elephants are steadily diminishing due to the encroachment of agriculture, encompassing both small-scale subsistence farming and expansive international agribusiness endeavors, notably those related to palm oil production Inskip, C., & Zimmermann, A. (2009). This relentless expansion forces elephants into ever-shrinking pockets of their remaining natural environments, which are increasingly encircled by crops that are highly appealing to these large herbivores. Consequently, elephants frequently resort to raiding and damaging these cultivated fields. This common challenge, particularly, for small-scale farmers who often find themselves in dire economic circumstances. The vulnerable individuals, sometimes compelled by harsh circumstances to encroach upon elephant habitats, face the grim reality of losing their entire source of livelihood overnight as a consequence of an elephant raid. Beyond the realm of small-scale agriculture, major corporate interests also grapple with significant losses in this conflict. Additionally, the ongoing struggle results in casualties and injuries on both sides, adding a human dimension to the broader ecological crisis.

Turkey, a country known for its three global hotspots, has a noticeable increase in issues related to Human –human-wildlife conflict (HWC). One significant aspect of this conflict revolves around carnivores killing on livestock, posing a major change (Chynoweth et. et. 1016). To safeguard their livestock from these wild animals many shepherds employ guardian dogs. Human-wildlife conflict remains a difficult challenge in wildlife conservation efforts, and this has a worldwide scope that continues to widen (Dowie 2011 and Woodroffe et al. 2005). It's important to note that a substantial portion of those most affected by HWC belong to economically disadvantaged communities, and the loss of crops stands out as a grave concern among them (Adams et al. 2004). The tangible consequences of human-wildlife conflict, such as injuries, fatalities, crop and livestock losses, are extensively documented.

Research conducted in Tanzania, for instance, indicates that between 1990 and 2004, lion attacks resulted in injuries or fatalities for over 800 individuals (Packer et al. 2005). Moreover, in several African nations, this conflict translates into significant losses, potentially amounting to 10% of the total agricultural output (Lamarque et al. 2009). Livestock depredation is yet another adverse outcome of human-wildlife conflict, especially pronounced in African countries where lions frequently target cattle on farms and ranches (Hazzah et al. 2009; Kissui, 2008).

Any connection between people and animals that has a negative effect on people's social, economic, or cultural lives as well as on wildlife conservation efforts or the environment has to be dealt with diligently (Agarwala M et al. 2010).Numerous species have gone extinct due to this battle (Chauhan, Aet al. 2010), ecosystem structure and function have changed (Imam E and Malik 2002), and there has been a tremendous loss of human life, crops, animals, and property (Meena R.Pet al. 2014). As the human population grows, so do its fundamental needs, and with that growth comes a high demand for habitat space, which must be met. Because of this, the forest, a natural habitat for animals, is destroyed, endangering both humans and wildlife for food and shelter.

Many sleepless nights are seen by Andhra People as 30 lives are dead because of the conflict between humans and elephants, bears and wild boars (News meter July 2022). There were 25 human casualties in 2019. There were 32 casualties in 2020. 3 districts are in a grip of human-elephant and human-bear conflict. Governments prioritize the needs of wildlife over those of local residents, which exacerbates the issue on a global scale. Kabita Thapaet.al., (2022).

According to a report by **Indian Express**, human activities in the Eastern Ghats Forest area, such as collecting forest produce and hunting activities, tend to overlap with the wildlife activities in the protected area of the forest and its buffer zone. This could signal a potential risk of increased human-wildlife conflict in the tropical forests of Eastern Ghats in the future[1].

Additionally, a **First post** article reports that with more than 50% of the green cover in forest areas being cleared by the Andhra and Telangana, wildlife is increasingly entering human habitations in times of drought. The article also mentions that elephant herds from Odisha and Tamil Nadu are entering farms and villages in Andhra Pradesh's border districts like Srikakulam and Chittoor, scaring villagers and destroying crops in search of food and water. Leopard attacks in Seshachalam hills which killed 6 years girl, and monkey attacks are due to dim lights on roads during night and the throwing of food articles by tourists attracting many wildlife animals (The New Indian Express Aug13 2023).

To comprehend the conservation of this recently invasive wildlife and wildlife-human interactions in village areas, an assessment is required. In this investigation, the Andhra Pradesh Municipalities and forest rangers examine the site, distribution, wildlife presence, and significant contentious monitoring of Wildlife. Recently, the escalating strife has forced many families to leave their homes, especially those who lived on the outskirts of the forest.

As settlements spread and land use changes, much of the world's biodiversity is increasingly restricted to small, fragmented patches within a matrix of human-dominated landscapes. This has led to the conflict's consequences on the economy, environment, society, and culture, Tangie S.N.Attia et.al.(2018).

Deforestation in some of the wild animals' natural habitats is forcing them to move elsewhere in their woodlands. Interestingly, this forest area is rich in natural resources, and state deforestation is more common in the area than singletree felling. In this paper, researchers sought to examine different aspects of human-wildlife conflicts and possible ways to stem property and life loss from human-wildlife conflicts. Treves, A., (2006)

Objectives of The Study

The study is aimed to understand the coexistence of humans and wildlife along with crop pastures. It also focuses on the sustainable management of forests, crop land` and ecosystems in coordination with humans as a point of interest. The theatrical interpretation and steps are suggested to mitigate Human-wildlife conflict and also to prevent crop loss thereby harmonical coexistence of humans and wildlife and the ecosystem are ascertained.

2. Materials And Methods

A field survey was carried out in the Villages, we moved on by the Rail and Bus route. Photographic evidence was taken by Canon EOS 3000D 18MP Digital SLR Camera. Local people's knowledge helped in finding ways and means of animal movement routes easily. Forest officials field guides and travel routes also helped in searching for animal details in many ways to find primary data for the research work.

The research design involved a combination of qualitative and quantitative research methods.

Information was gathered through interviews with farmers, group discussions by other villagers, field observation by community leaders, and government officials, the Internet and direct observations of attacks on crops, and human and domestic animals with wildlife, approximately fifty-five farmers were interviewed and data was collected.

Additional data was collected from three hundred families' interviews. The extant of crop loss, number of individuals involved in damage etc., were collected by structured questionnaires

Data was also collected daily from the Forest Department, newspapers, different books, and different authors (Robert Foster Walden, 2017). The survey was conducted from the year 2020-23 in the given below sites.

3. Results and Discussion

Definition of Mean:

A mean in maths is the average of a data set, found by adding all numbers together and then dividing the sum of the numbers by the number of numbers. For example, with data set: 8, 9, 5, 6, 7 The mean is 7 as $8 + 9 + 5 + 6 + 7 = 35$, $35/5 = 7$

Definition of Standard Deviation:

In statistics, the standard deviation is a measure of the amount of variation or dispersion of a set of values. A low standard deviation indicates that the values tend to be close to the mean of the set, while a high standard deviation indicates that the values are spread out over a wider range.

Significance of Standard Deviation:

A standard deviation is a measure of how dispersed the data is in relation to the mean. Low or small, standard deviation indicates data are clustered tightly around the mean, and high, or large, standard deviation indicates data are more spread out.

Table 1: Land Wise Classification of Areas Surveyed During the Study Period 2020-2023.

DISTRICT/AREA	Rainfed agriculture	Irrigated agriculture	Forest - woodland
	Area in Acres	Area in Acres	Area in acres
Srikakulum	30	10	55
Parvathipuram	25	08	50
Lamba Singh	10	05	20
Reddy Ganapavaram	12	20	10
Jangareddy gudem	14	40	30
Virabadhrapuram	15	10	25
Palakunta	24	30	16
Jaggisettigudem	15	45	12
Prakash Nagar, Eluru district	5	20	8
Sanivarpet, Eluru district	10	10	5

Table 2: Standard Deviation Ofrainfed Agricultural Area In Acres Surveyed During The Study Period 2020-2023.

DISTRICT/AREA	Rainfed Area in Acres	$(x_i - \bar{x})$	$(x_i - \bar{x})^2$
Srikakulum	30	16 - 30 = -14	196
Parvathipuram	25	16 - 25 = -09	81
Lamba Singh	10	16 - 10 = 06	36
Reddy Ganapavaram	12	16 - 12 = 04	16
Jangareddy gudem	14	16 - 14 = 02	4
Virabadhrapuram	15	16 - 15 = 01	1
Palakunta	24	16 - 24 = -08	64
Jaggisettigudem	15	16 - 15 = 01	1
Prakash Nagar, Eluru district	5	16 - 05 = 11	121
Sanivarpet, Eluru district	10	16 - 7 = 9	36
	160	$(x_i - \bar{x})$ =62	556

$$\text{Mean}(\bar{x}) = \frac{\text{Sum of observations}}{\text{No. of observations}}$$

$$\text{Mean}(\bar{x}) = \frac{30 + 25 + 10 + 12 + 14 + 15 + 24 + 15 + 5 + 10}{10}$$

$$\bar{x} = \frac{160}{10} = 16$$

$$\text{Variance} = \frac{1}{n} \sum (x_i - \bar{x})^2 = \frac{556}{10} = 55.6$$

$$\text{Standard Deviation} = \sqrt{\text{Variance}} = \sqrt{55.6} = 7.4565$$

Table 3: Standard Deviation of Irrigated Agriculture Area in Acres Surveyed During the Study Period 2020-2023.

DISTRICT/AREA	Irrigated agricultural area in acres	$(x_i - \bar{x})$	$(x_i - \bar{x})^2$
Srikakulum	10	18 - 10 = 8	64
Parvathipuram	8	18 - 8 = 10	100
Lamba Singh	5	18 - 5 = 13	169
Reddy Ganapavaram	20	18 - 20 = -2	4
Jangareddy gudem	40	18 - 40 = -22	484
Virabadhrapuram	10	18 - 10 = 8	64
Palakunta	30	18 - 30 = -12	144
Jaggisettigudem	45	18-45 = -27	729
Prakash Nagar, Eluru district	20	18 - 20 = - 2	4
Sanivarpet, Eluru district	10	18 - 10 = 8	64
	180		1826

$$\text{Mean}(\bar{x}) = \frac{\text{Sum of observations}}{\text{No. of observations}}$$

$$\bar{x} = \frac{10 + 8 + 5 + 20 + 40 + 10 + 30 + 45 + 20 + 10}{10}$$

$$\bar{x} = \frac{180}{10} = 18$$

$$\text{Variance} = \frac{1}{n}\sum(x_i - \bar{x})^2 = \frac{1826}{10} = 182.6$$

$$\text{Standard Deviation} = \sqrt{\text{Variace}} = \sqrt{182.6} = 13.5129$$

Table 4: Standard Deviation Of Forest-Woodlandarea In Acres Surveyed During The Study Period 2020-2023.

DISTRICT/AREA	Forest Wood land Area in acres	$(x_i - \bar{x})$	$(x_i - \bar{x})^2$
Srikakulum	55	23.1 - 55 = - 31.9	1017.61
Parvathipuram	50	23.1 - 50 = - 26.9	723.61
Lamba Singh	20	23.1 - 20 = 3.1	96.1
Reddy Ganapavaram	10	23.1 - 10 = 13.1	171.61
Jangareddy gudem	30	23.1 - 30 = - 6.9	47.61
Virabadhrapuram	25	23.1 - 25 = - 1.9	3.61
Palakunta	16	23.1 - 16 = - 7.1	52.54
Jaggisettigudem	12	20.1 - 12 = 11.1	123.21
Prakash Nagar, Eluru district	8	23.1 - 8 = 15.1	228.01
Sanivarpet, Eluru district	5	23.1 - 5 = 18.1	327.61
	231		7504.91

$$\text{Mean}(\bar{x}) = \frac{\text{Sum of observations}}{\text{No. of observations}}$$

$$\bar{x} = \frac{55 + 50 + 20 + 10 + 30 + 25 + 16 + 12 + 8 + 5}{10} = \frac{213}{10} = 23.1$$

$$\text{Variance} = \frac{1}{n}\sum(x_i - \bar{x})^2 = \frac{7504.91}{10} = 750.491$$

$$\text{Standard Deviation} = \sqrt{\text{Variance}} = \sqrt{750.491} = 27.3950$$

$$\text{Mean } \bar{x} = \frac{119.9}{10} = 11.99$$

$$\text{Variance} = \frac{1}{n}\sum(x_i - \bar{x})^2 = \frac{390.309}{10} = 39.0309$$

$$\text{Standard Deviation} = \sqrt{39.0309} = 6.2474$$

Table 4: Yearly Variation Among The Crops During The Year 2020-2021, 2021-2022, 2022-2023.

Crop Loss	YEAR 2020-2021	2021-22	2022-2023
Maize	16	10	8
Paddy	25	15	10
Ground nut	8	4	5
Brinjal	18	14	10
beans	9	7	4
Chilli	7	4	2
Mango	10	8	4

Table 5: Percent of Farm And Whole Product Or Whole Grain Loss Incurred During The Year 2020-2023

Crop Loss	No. of raiding events	Mean % loss on farms in acres experiencing damage	Mean % loss (Whole sample product)
Maize	16	2%	1.8%
Paddy	25	4%	3.0%
Ground nut	08	2.2%	2.3%
Brinjal	18	1.2%	1.7%
beans	09	0.8%	0.8%
Chilli	07	0.5%	0.6%
Mango	10	1.5%	2.0%

Table 6: Standard Deviation Across The Years 2020-2023 Of Farm And Whole Product Or Whole Grain Loss Incurred During The Year 2020-2023

Crop Loss	No.of raiding events	$(x_i - \bar{x})$	$(x_i - \bar{x})^2$	Mean% loss on farms in acres experiencing damage	$(x_i - \bar{x})$	$(x_i - \bar{x})^2$	Mean% loss (Whole sample producer	$(x_i - \bar{x})$	$(x_i - \bar{x})^2$
Maize	16	-2.33	5.4289	2%	0.22	4.84	1.8	0.1	0.01
Paddy	25	6.67	44.4889	4%	2.22	4.9284	3.0	1.3	1.69
Ground nut	08	-10.33	106.7089	2.2	0.42	0.1764	2.3	0.6	0.36
Brinjal	18	0.33	0.1089	1.2	-0.58	0.3364	1.7	0	0
Beans	09	-9.33	87.0489	0.8	-0.98	0.9604	0.8	-0.9	0.81
Chilli	34	15.67	245.5489	0.5	-1.28	1.6384	0.6	-1.1	1.21
Total	110		489.3334	10.7		12.88	10.2		4.08

No.of raiding events experiencing damage

$$\text{Mean}(\bar{x}) = \frac{\text{Sum of observations}}{\text{No.of observations}}$$

$$\bar{x} = \frac{110}{6} = 18.33$$

$$\text{Variance} = \frac{1}{n}\sum(x_i - \bar{x})^2$$

$$= \frac{489.3334}{6} = 81.5555$$

$$\text{Standard Deviation} = \sqrt{\text{Variance}}$$

$$= \sqrt{81.5555} = 9.0308$$

Mean% loss on farms in acres

$$\text{Mean}(\bar{x}) = \frac{\text{Sum of observations}}{\text{No.of observations}}$$

$$\bar{x} = \frac{10.7}{6} = 1.78$$

$$\text{Variance} = \frac{1}{n}\sum(x_i - \bar{x})^2$$

$$= \frac{12.88}{6} = 2.1466$$

$$\text{Standard Deviation} = \sqrt{\text{Variance}}$$

$$= \sqrt{2.1466} = 1.4651$$

Mean% loss (Whole sample produced)

$$\text{Mean}(\bar{x}) = \frac{\text{Sum of observations}}{\text{No.of observations}}$$

$$\bar{x} = \frac{10.2}{6} = 1.7$$

$$\text{Variance} = \frac{1}{n}\sum(x_i - \bar{x})^2$$

$$= \frac{4.08}{6} = 0.68$$

Standard Deviation $= \sqrt{\text{Variance}}$
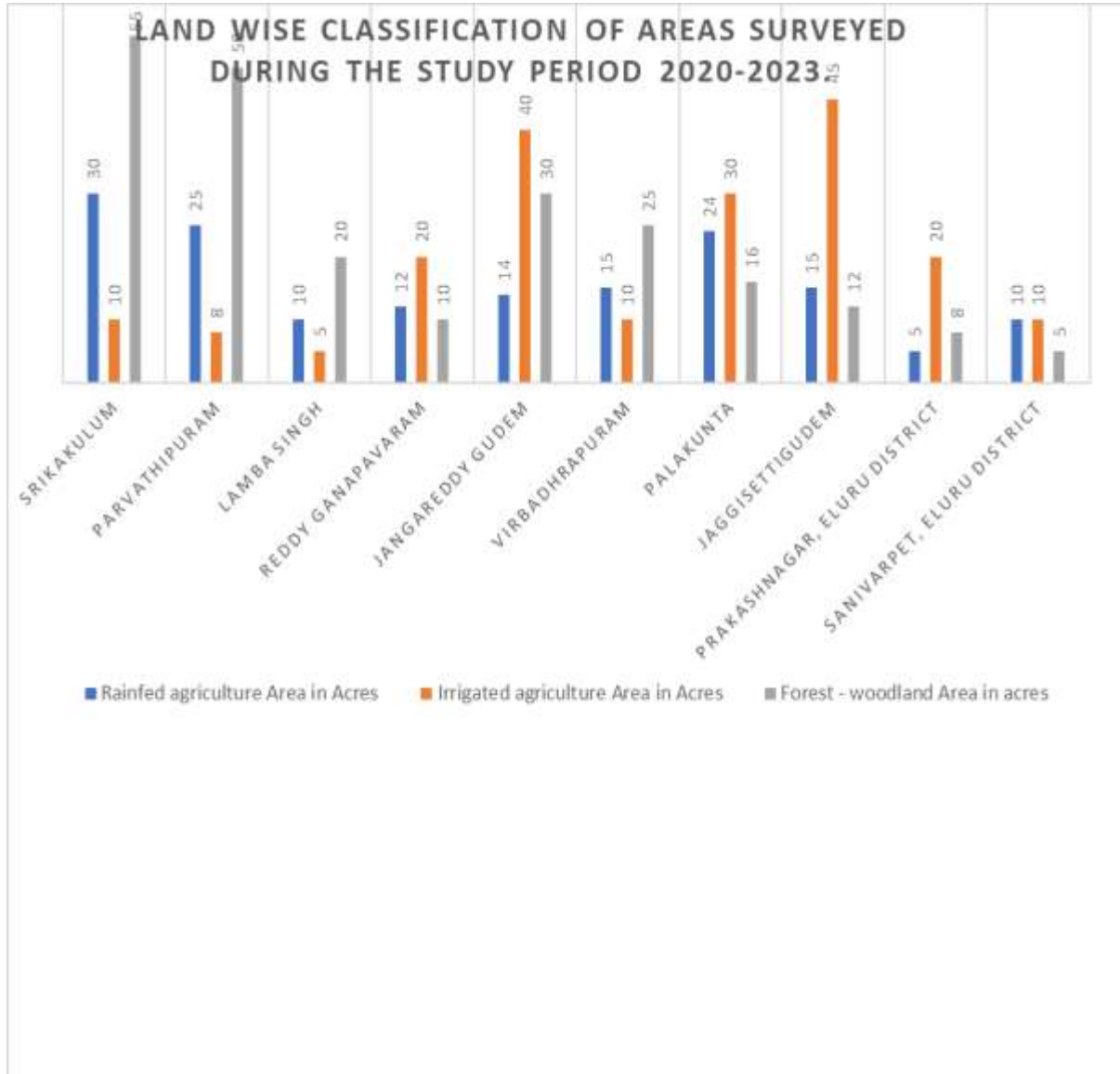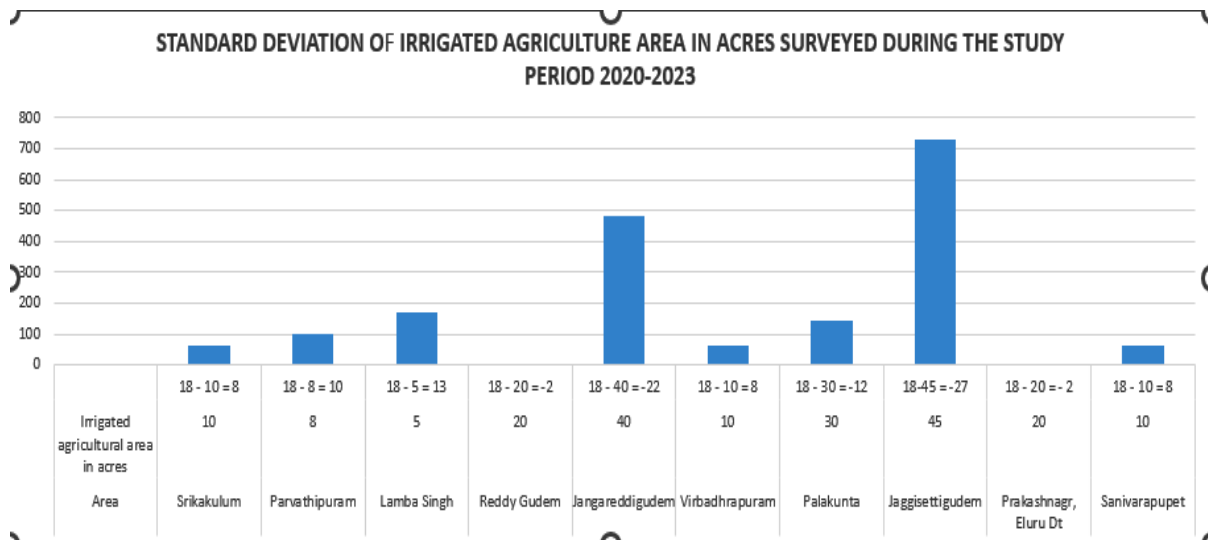
$$= \sqrt{0.68} = 0.8246$$

Figure 1:

LAND WISE CLASSIFICATION OF AREAS SURVEYED DURING THE STUDY PERIOD 2020-2023

■ Rainfed agriculture Area in Acres ■ Irrigated agriculture Area in Acres ■ Forest - woodland Area in acres
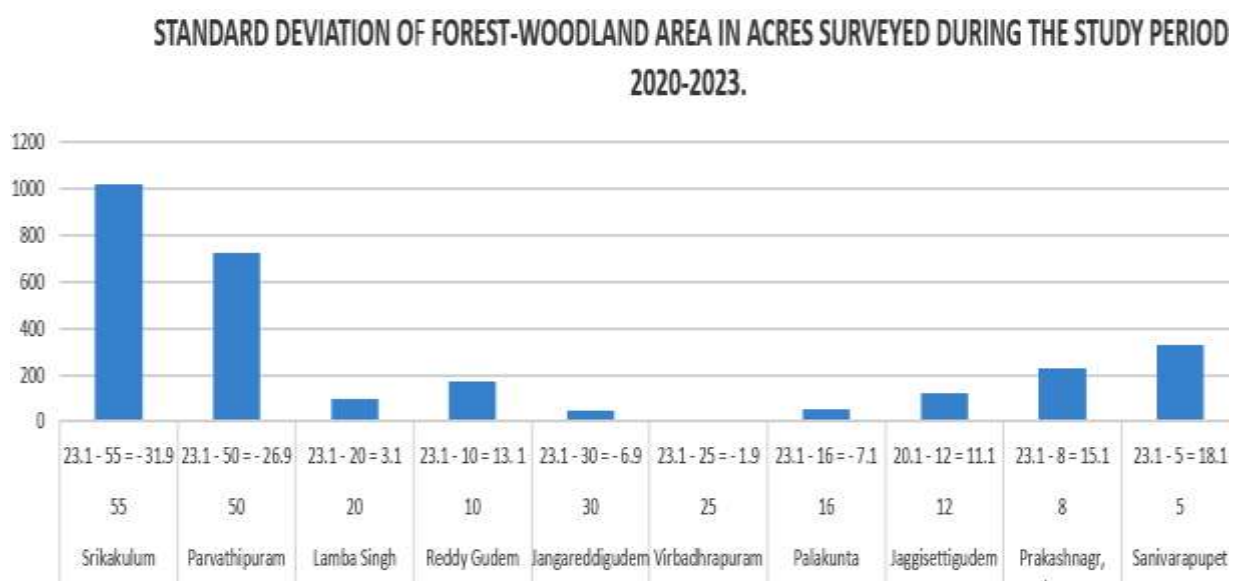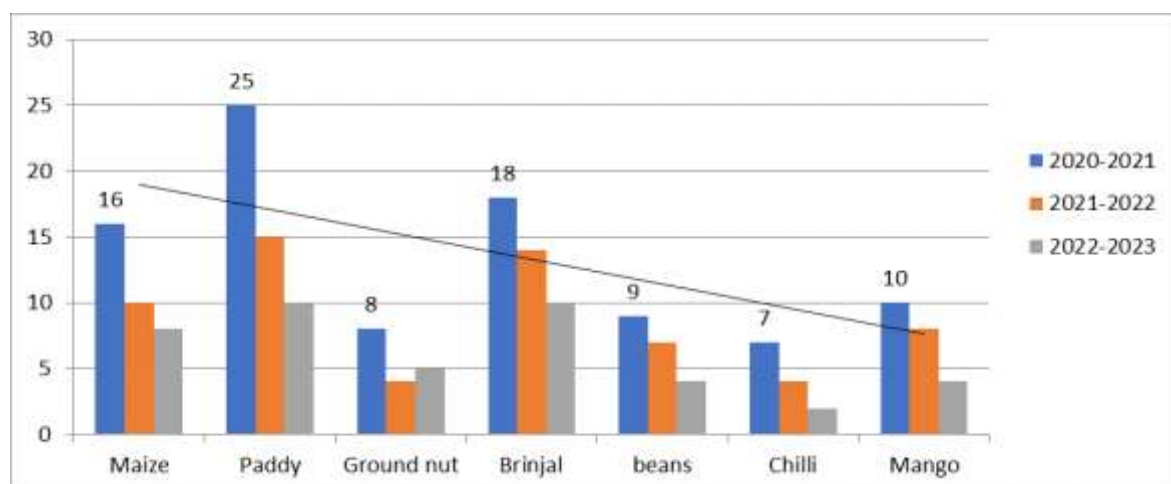
Figure 2:

Figure3:

Figure 4:

The fieldwork conducted during the year 2020-23about human-wildlife conflict in Andhra Pradesh shows that it has a significant problem, with a considerable impact on the livelihoods of rural communities. The main types of wildlife responsible for crop loss were insects, mollusks, monkeys, rats, wild pigs, wild boars, elephants, goats, cows, deer, squirrels, etc. These animals were found to cause substantial economic losses to the farmers.

The fieldwork conducted revealed that in Lambasingi, Parvathipuram, and Srikakulam, monkeys were the primary cause of crop loss. In Sanivarpupeta and Santi Nagarof Eluru district Rats were found to be

the primary cause of crop loss. In Reddiganapavaram, Jaggi Settigudem, Virabhadhrapuram, and Palakunta, wild pigs and wild boars were the primary cause of crop loss.

Astonishingly lower animals of zoological phylogeny which does not have much importance in the ecosystem are also causing a greater scale of damageby insects, locust, caterpillars, molluscs, birds, rodents, rats, many primates some antelope.

To curb insect and snail populations in rice fields, tobacco, citrus, heartleaf, and false pickler weed leaves are planted around crop areas which will naturally control snail populations. Molluscicides like metaldehyde and nicodamid are used to suppress snail populations chemically, but only on seedlings that are 30 days old. To cover the snails' routes, spreading a bait made of rice bran and 5% metaldehyde, scattering 5% metaldehyde pellets over the infected plants, or spraying of 0.5% carbaryl or fenitrothion, 1.3% lindane dust, or copper sulfate at a rate of 20 kg/haare insecticides and NaCl, Epsom Salt, Boric acidetc., are good manures which help in crop growth. To lessen their hiding spots and lower their population, the removal of all weeds and plant debris is done. It is challenging for snails to eat on crops with grid leaves because the plants hurt the snails. Additionally, the farmer could use the beneficial organic practice of trap cropping Karma Tenzin (2017).

Maize is attacked by Goats, Cows, Sheep, Guinea Pigs, Rabbits stray pigs and donkeys. Mostly they are kept apart by fencing of wires or by planting prickle plants. There are numerous grazing management methods available, including rotational, mob, cell, and holistic approaches for crops like rice, maize groundnut brinjal, beans, etc. These methods are followed to keep the animal apart.

Ground Nuts are attacked by pests, beetles, moths, insects, Aphid, Thrips, Gram pod borer, caterpillars, locust white grub different Molds and rusts. Mostly biological and chemical control practices are done to prevent the menace.

On Brinjal numerous insect pests, such as the shoot and fruit borer, whitefly, leafhopper, aphid, stem borer, leaf roller, and mites, cause severe yield losses preying on the crop. Cattle and goats rearing on the crop fields of maize, paddy, ground nut, and brinjal are attacked by tigers damaging a wide area of crop during the activity of chasing. Approximately 15% of the crop is damaged. The above crops along with beans are eaten by deer, rabbits, wild birds and chickens, and domesticated cats.

Mangoes crop is attacked by **squirrels and deer, elephants, and wild boars which are** prevented by Noise, fire, Spotlight, Chilli smoke, and Barrier. Numerous insects of the order Hymenoptera, Diptera, Lepidoptera Coleoptera also attack different parts of the tree. In certain regions, Communities grapple with a pressing issue concerning "problem animals". These creatures have become a significant challenge for local inhabitants, as their activities lead to extensive losses in terms of livestock, agricultural produce, and overall economic well-being. Efforts by various forms of law enforcement have proved ineffective in mitigating the impact of these creatures resulting ina number of raids and destruction of vital food crops. This surge in Human–Wildlife Conflict (HWC) instances further makes worse the situation. The frequency of HWC incidences raises alarming concerns about the potential extinction of certain species, in addition to precipitating a domino effect of economic consequences. This includes diminished income due to the compromised quality of cash crops for sale, as well as the loss of valuable livestock. Moreover, the alteration of local biodiversity further compounds the challenges faced by farmers residing in close proximity to these border areas. This issue is crucial for the well-being of both communities and the environment.

There are some "problem animals" and the local communities' hands are curbed dealing with them resulting in high damage to livestock, crops, or the economy with their increase in raids and destruction of food cropsin creasing HWC frequency. Various types of law enforcement are unable to curb these problems. But if the frequency of the HWC increase there are chances of extinction of species, loss of income due to the sale of damaged cash crop, loss of livestock, change in biodiversity, etc. causing havoc in the lives of the farmers who are living near the border area.

4. Conclusion
The impact of HWC on the livelihoods of rural communities is significant, with substantial economic losses for farmers. The findings of this research will be used to inform policymakers to mitigate the impact of human-wildlife conflict on rural livelihoods of Andhra Pradesh. The commitment of stakeholders is crucial in developing effective and sustainable strategies to address environmental problems and preserve diverse ecosystems and their wildlife populations, Distefano, E. (2005). Human-wildlife conflict (HWC) is an escalating concern for communities situated near protected areas. These conflicts frequently manifest as crop destruction and wildlife attacks, increase. Human-wildlife conflict arises due to human activities such as expanding settlements, agriculture, overgrazing by livestock,

illegal grass harvesting, and deforestation. These actions have led to the displacement of wildlife, causing resentment towards their present situation Safi Mekonen (2020). Loss of economy, lives and body parts damages make the conflict even more grievous. Growth in human population, encroachment leading to decrease and destruction of habitat, cramped movements, sparse availability of forest resources out of fear of wildlife, and lack of organized approach to tackle the situation worsen the condition further.

It has come to our attention that the increasing incidents of wild animals encroaching upon the homes and crop areas have been causing considerable damage and inconveniences. It is heartening to observe the proactive steps, collectively taken to mitigate these issues and secure the living spaces.

One of the primary challenges the people face is the disturbance of wild animals into their crop areas. These animals often target the crops, which are essential for their livelihoods. To combat this, the villagers have taken the initiative to plant bushes around their houses and crop areas. These bushes serve as a natural barrier, making it difficult for wild animals to enter these spaces.

Furthermore, the use of dry leaves from palm trees as a form of natural fencing has proven to be an effective deterrent. The rustling sound of these leaves and the prickly texture create an environment that discourages animals from venturing further into the fields and homes. For those who have access to more resources, cement walls have been constructed to safeguard the properties. These walls not only provide physical protection but also serve as a visual deterrent to wild animals. In some instances, low electric wires have been installed as an additional security measure. These wires act as an invisible barrier, and when electrified, they can deliver a non-lethal shock to discourage animals from crossing into our territories. However, it's essential to ensure the safety of wildlife while using such measures. It is also noticed that when wild animals approach, the communities come together and produce loud sounds, which not only alert others but also create a collective wave of noise that scares away these animals. This community effort has been instrumental in protecting homes and crop areas. In conclusion, the united efforts in planting bushes, using dry palm leaves, constructing cement walls, and even installing electric fencing have demonstrated the commitment to protecting homes and livelihoods from the intrusion of wild animals.

Figure 1SURVEY OF DAMAGE CAUSED DUE TO RODENTS.

Figure2INVESTIGATING DAMAGE CAUSED BY MONKEYS TO BANANA CROPS

Figure 3PADDY FIELD DAMAGE CAUSED DUE TO WILD BUFFALO

Figure 4 INSPECTION OF CASHEW NUT CROP ATTACKED BY PESTS

Figure 5 CROP DAMAGE DUE TO LOCOUST ATTACK

Figure 6 DAMAGE CAUSED DUE TO WILD BOARS.

Figure 7 LOCUSTS KILLED BY FUMIGATION

Cashew Nut Field Attacked And Destroyed By Wild Animals

Mango And Timber Trees Attacked By Wild Elephants

Wild Elephants Attacking Farm Land

Wild Elephants Attacking Garlic and Sugarcane Crops.

Wild Elephants Attacking Maize Crop

Tiger Venturing into Human Habitat Area

References:

1. WWF Magazine, spring Issue (2023). What is human-wildlife conflict and why is it More than just a conservation concern.1250 24th Street, N.W. Washington, DC 20037.
2. Nyhus, P. J., Osofsky, S. A., Ferraro, P., Madden, F., & Fischer, H. (2005). Bearing the Costs of human-wildlife conflict: the challenges of compensation schemes. Conservation Biology, 19(3), 871-879.
3. Aditi Pandey, Ashish Oberoi, Aman sharma, Avedesh Abardawaj (2017). Analysis of human -wild life conflict management. Engineering Science International Research Journal.Vpl.5 Special issue, ISSN 2320-4338, pg: 63-65.
4. Thirgood, S., Woodroffe, R. and Rabinowitz, A. (2005) The Impact of Human Wildlife Conflict on Human Lives and Livelihoods. In: Woodroffe, R., Thirgood, S. and Rabinowitz, A., Eds., People and Wildlife: Conflict or Coexistence? Cambridge University Press, Cambridge, UK, 13-26.

5. Tangie Stanley Ndifor Attia1,* Tchamba .N. Martin1, Tumenta Pricelia Forbuzie1 et.al.Human Wildlife Conflict: Causes, Consequences and Management Strategies in Mount Cameroon National Park South West Region Cameroon. International Journal of Forest, Animal and Fisheries Research, Vol-2, Issue-2, Mar-Apr, 2018. ISSN: 2456-8791,pg: 34-49.

6. Dickman, A. J. (2010). Complexities of conflict: the importance of considering social factors for effectively resolving human-wildlife conflict. Animal Conservation, 13(5), 458-466.

7. Inskip, C., & Zimmermann, A. (2009). Human-felid conflict: a review of patterns and priorities worldwide. Oryx, 43(1), 18-34.

8. Human-Wildlife conflict one of the greatest threats to wild life species, WWF and UNEP July 2021 press release.

9. Robert Foster Welden, 2017, MSc. Thesis, Colorado State University, Fort Colins, Colorado.

10. Karma Tenzin, Sangay Wangchuk, Norbu Wangdi, JimWangchuk.   (2017). Human-Wildlife Conflict - Science topic. ResearchGate.

11. Distefano, E. (2005). Human-Wildlife Conflict worldwide: collection of case studies, analysis of management strategies and good practices. SARD. Initiative Report, FAO, Rome.

12. Safi Meknon, Sept. S2020. Coexistence between human and wildlife:the nature, causes and mitigations of human wildlife confict around Bale Mountains National Park, Southeast Ethiopia. BMC Ecology, Springer, Nature, Article 51pg: 35-43.

13.S.K. Palita and K.L. Purohit (2008) Proceedings of the HADP Sponsored Seminar on Endemic & Endangered Species of the Nilgiris, pp. 86-99

14.Dr. KUNTAL KISHOR Dr. AKHILESH KUMAR UPADHYAY (2023) HUMAN-WILDLIFE CONFLICT IN NORTHERN CHHATTISGARH VOL. 4 ISSUE NO.2 chaitanya.ejournal@baou.edu.in Page | 86-99

15. Avinash Kumar Swami, Jyoti Paraste, Sita Maravi and Shivaji Chaudhry (2019)

Human wildlife conflicting species and its impact on rural people of Central India2019 JETIR May 2019, Volume 6, Issue 5 www.jetir.org (ISSN-2349-5162) Amarkantak-484 886, Madhya Pradesh, India

16.Anonymous (2016) Madhya Pradesh: 260 people killed in man-animal conflict in past 5 years. The Indian Express. Bhopal.

17.Dowie M.(2011). Conservation refugees: the hundred-year conflict between global conservation and native Peoples. MIT Press; 2011.

18.Woodroffe R.; Thirgood S.; Rabinowitz A.; (2005).The future of coexistence: resolving human-wildlife conflicts in a changing world. ConservBiolSerCamb. 2005; 9: 388.

19. Adams W.M.; Aveling R.; Brockington D.; Dickson B.; Elliott J.; Hutton J.; Roe D.; Vira B.; Wolmer W.(2004). Biodiversity conservation and the eradication of poverty. Science 306, 1146–1149.

20. Treves, A., Wallace, R. B., Naughton-Treves, L., & Morales, A. (2006). Co-managing human-wildlife conflicts: a review. Human Dimensions of Wildlife, 11(6), 383-396.

21. Hoare, R. (1999). Determinants of human-elephant conflict in a land-use mosaic. Journal of Applied Ecology, 36(5), 689-700.

22. Ogada, D. L., Woodroffe, R., Oguge, N. O., & Frank, L. G. (2003). Limiting depredation by African carnivores: the role of livestock husbandry. Conservation Biology, 17(6), 1521-1530.

23. Packer, C., Ikanda, D., Kissui, B., & Kushnir, H. (2005). Lion attacks on humans in Tanzania. Nature, 436(7053), 927-928.

24. Redpath, S. M., Gutiérrez, R. J., Wood, K. A., & Young, J. C. (2015). Conflicts in conservation: navigating towards solutions. Cambridge University Press.

25. Naughton-Treves, L., Grossberg, R., & Treves, A. (2003). Paying for tolerance: rural citizens' attitudes toward wolf depredation and compensation. Conservation Biology, 17(6), 1500-1511.

26. Man-animal   conflict   worsens   in   Andhra   Pradesh.   The   Times   of   India. http://timesofindia.indiatimes.com/articleshow/92507221.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst. Dated June 28 2022.12:19 IST.

27. Human-animal conflict: Andhra loses 30 lives every year; experts blame shrinking forest cover, Newsmeter, Network Published on 1 July 2022 9: 01 AM.

Human development in forests leading to wildlife attacks'. The New India Express.Published: 13th August 2023 10:11 AM. Visakhapatnam.

28. Agarwala M., Kumar S., Treves A. and Naughton-Treves L. (2010). Paying for wolves in Solapur, India and Wisconsin, USA: Comparing compensation rules and practice to understand the goals and politics of wolf conservation. Biological Conservation, 143(12): 2945–2955.

29.Bakshi P.M. and Kashyap S.C. (2012). The constitution of India. Universal Law Publishing. Bagchi S. and Mishra C. (2006). Living with large carnivores: Predation on livestock by the snow leopard (Unciauncia). J. Zoology, 268(3): 217- 224.

30.Chauhan, A. and Pirta, R.S. (2010a). Agonistic interactions between humans and two species of monkeys (Rhesus Monkey Macaca mulattaand Hanuman Langur Semnopithecus entellus)in Shimla, Himachal Pradesh. J. Psychology, 1(1): 9–14.

31. Imam E., Yahya H.S.A. and Malik I. (2002). A successful mass translocation of commensal rhesus monkeys (Macaca mulatta) in Vrindaban, India. Oryx, 36(1): 87–93.