

Illegal wildlife Trade in a Protected Area of Western Himalayas, Nepal

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Research Article

Keywords: Annapurna region, Endangered species, Illegal wildlife trade

Posted Date: September 11th, 2023

DOI: <https://doi.org/10.21203/rs.3.rs-3326827/v1>

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Additional Declarations: No competing interests reported.

Abstract

Illegal wildlife trade (IWT) in Nepal, like many parts in the globe, possesses significant threat to many endangered species. IWT is possessing significant threat to conservation challenge in Nepal due to its proximity to major consumer markets in China and India serving as both source and transit. This research focuses on the illegal wildlife trade and complex dynamics of human associated behind such activities prevailing around Annapurna Conservation Area (ACA) of Nepal.

Study was carried by mixed method using both qualitative and quantitative methods. Qualitative analysis was performed based on summative content analysis and in-depth interviews with conservation experts and individuals convicted for illegal trading. Quantitative analysis was performed based on the data obtained from official record of ACA and published reports from national agencies in relevant field.

Among all the seized items wild fauna *Muntiacus vaginalis* was largely traded in Annapurna region which accounted for 40%. Rare species such as *Moschus chrysogaster*, *Panthera uncia*, *Naemorhedus goral*, *Hemitragus jemlahicus* and *Lophophorus impejanus* which come under CITES Appendix I were also seized in significant amounts. Among seized flora, rare species found were *Paris polyphylla*, *Ophiocordyceps sinensis*, *Dactylorhiza hatagirea*. The study identified five major themes: traded species; major trade routes; motivating factors; coordination and cooperation between the stakeholders; and law enforcement challenges of illegal wildlife trade.

Study found that significant percentage of vulnerable and endangered species were illegally traded in Annapurna Conservation Area. The finding emphasized the importance of development of collaborative initiative with local communities and also showed the immediate need of enhancing the understanding of relevant stakeholders regarding legal, social, economic, and environmental impacts of the illegal trade in Annapurna region.

Background

Illegal wildlife trade (IWT) refers to the various illicit activities such as trapping, poaching, exporting, smuggling, consuming, etc. of wild flora and fauna that could be dead or alive including their parts and derivatives which are governed by national and/or international laws and regulation (UNDCO 2010; South & Wyatt 2011; Mozer & Frost 2023). IWT possesses a high global conservation challenge and is considered one of the biggest threats to biodiversity conservation (Wyler & Sheikh 2013; Brown & Davies 2014). Not only does IWT poses a direct threat to the species' populations but also threatens the basic function of the ecosystem (Challender et al. 2015) and disrupts the wellbeing and resilience of the communities that depend on the wildlife for their survival (Cardoso 2021).

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) signed by 184 parties in 1987 is an international agreement, recognized as the preeminent international treaty on the conservation of biodiversity (Fuchs, 2008). Nepal has been member of the CITES since 1973 and has been demonstrating its commitment for contributing to global conservation efforts (GoN 2014). Nepal

has substantial number of flora and fauna species listed in CITES among these 51 mammals, 40 birds, 13 reptiles, 1 amphibian and 21 plant species are listed under CITES (CITES 2008). Among 126 flora and fauna listed in CITES, 51 of them are listed in Appendix I, while 31 species are listed under [Appendix I](#) and remaining are listed in Appendix 3 (Dongol and Heinen 2012). Nepal is landlocked country located between two larger country India and China with diverse floral and faunal species, natural ecosystems, ranging from lowland Terai region to the high Himalayas (GoN 2014). Since early 1990s, China has emerged as one of the world's largest consumers of the products based on wildlife (Zhou and Jiang 2004; UNODC 2013; Jiao & Lee 2022)) and simultaneously, Nepal is facing major challenges from illegal wildlife trade, serving both as source and transit (Wang and Li 1998; Li et al. 2000).

The commercial exploitation of wildlife has been leading to the decline of numerous flagship species such as Bengal tigers (*Panthera tigris tigris*), Snow leopards (*Panthera uncia*), Indian rhinoceros (*Rhinoceros unicornis*) (Paudel et al. 2020). Despite this concerning trend, country's conservation effort has been successfully restoring some flagship species like Indian rhinoceros and Bengal Tiger (WWF 2014). Recently, Nepal has achieved a historic millstone by doubling the tiger population (DNPWC & DFSC 2022). The dedication and effectiveness initiative with intensified field activities from various enforcement agencies across the country has yield significant results of numerous seizures and arrests (DNPWC 2014).

Despite significant advancement has been made in recent years regarding the improvement in the conservation efforts of many flagships' species, the persistence of the black market poses an ongoing threat (Dhakal & Baral 2015; Bhattarai et al. 2017; Paudel et al. 2020). Nepal is continuously functioning as both the transit and the source for the wildlife trafficking, (Burgess, et al. 2014) and Bogati et al. (2021) highlighted that there is interlinked in illegal trade between Nepal, China, India, Bhutan. Law enforcement agencies are lacking the technical methods for mapping out the routes, analyzing and interruption of trading activities (Keskin et al. 2022) and are lacking the understanding of the motive for driving IWT (Camargo et al. 2022). Despite the increasing coverage of global protected area, biodiversity continues to decline (Watson et al. 2014), so the increase in protected area doesn't guarantee the efficient conservation (Visconti et al. 2019; Geldmann et al. 2019; Hoffmann 2021). Protected area usually plays a crucial role for preventing poaching or alternatively can also facilitate to be the place for exploitation (Fukushima et al. 2021). The protected areas also limit the access of resources to the local and indigenous people creating various conflicts that can undermine conservation goals (Andradr & Rhodes 2012). Nepal has made significant network of protected areas throughout the country covering 23.39% of its area (MoFE 2018). However, the major threat to the biodiversity in protected areas in Nepal is primarily attributed to IWT (Tiwari 2022).

The Annapurna Conservation Area (ACA) is the foremost Conservation Area in Nepal launched in 1986. It is the largest Protected Area in Nepal covering an area of 7,629 sq. km. (NTNC 2021). ACA in a remarkable region with its unique geographical position and topography and despite its conservation status, it has not been immune to IWT. Thus, this research aims to gain comprehensive understanding

about illegal wildlife trade prevailing around ACA. The study intends to fulfil the information gap and aware policy makers mainly on major illegal trade routes and species/trophies captured methods of smuggling, as well as understanding the motives and complex dynamics of human associated with Annapurna Region.

Methods

The study was conducted in and around the Annapurna conservation area of Nepal which includes four district Mygdi, Mustang, Kaski and Lamjung. These districts have good connectivity with both India and China. The Fig. 1 shows the study area which consist of 4 districts in Gandaki Province.

This study includes a 10-year (2011 to 2020) analysis of seized illegally wildlife in and around Annapurna Conservation area. Total 54 incidents were recorded in the last 10 years by Nepal Police, Annapurna Conservation Area Project Offices and District Forest Offices. Study was carried initially by quantitative methods which was complemented and supported by qualitative methods. Qualitative analysis was performed based on summative content analysis and in-depth interviews with conservation experts, individuals living within the protected area, as well as the individual that were convicted for illegal trading who shared their perspective, knowledge and insights on how and why illegal wildlife activities happens in conservation area. However, findings from qualitative research were not limited to pre-established questionnaire therefore respondent expressed their opinions independently and the results were drawn in real world situations. The research also dealt with in-depth study on how social values, norms and community attitude play important role in facilitating and driving illegal wildlife trade.

Data Collection

The primary data were collected through observation, measurement and analysing the 54 incidents recorded in last 10 years. Moreover, key informants' interview was conducted with different officials and individuals responsible for the control measures of illegal trade. The key informants were division forest officer, chief warden and assistant warden, who were involved in protection against the illegal trade of wildlife trade in Annapurna range along with individuals living within the protected area, as well as the individual that were convicted for illegal trading.

Secondary data was obtained from the published reports from Government of Nepal and the official records obtained from ACAP office, Pokhara, DFOs: Kaski, Myagdi, Lamjung, Manang, Mustang. The information and records regarding arrest and seized were collected and analysed.

Data analysis and tools

Data analysis is the process of exploring, evaluating, and finding patterns of data using the statistical tools. Mainly univariate analysis was done generating the descriptive information. Tool used for collecting data was in-depth interview which includes semi-structured and open-ended questions. Qualitative study used in this study was flexible in its design which was amended if required. Qualitative

analysis was done mainly based on summative content analysis of the qualitative data obtained from in-depth interviews. Summative analysis was conducted based on predesigned codes their count or occurrences and the themes were generated. Study started with key words (initial codes); keywords were defined during the analysis (count or occurrences); Major themes were derived from the keywords (themes).

Results

Illegal wildlife trade is a threat to biodiversity globally and an organized environmental crime (Bhuju et al. 2009; Wyler & Sheikh 2013). Most of the captured body parts in ACA were from Pokhara and some body parts of captured were from the animals those had protection status under CITES as well as IUCN red list.

Figure 2 shows the point of captured of illegal wildlife trophies in ACA and it can be seen from the figure that point of capture is located around the boarder of the different districts. The maximum number of captured has been around Pokhara Metropolitan City which is because of various checkpoint around Pokhara.

Table 1: Wild fauna captured in ACA between 2011 to 2020

Local name	Scientific name	IUCN Redlist	CITES Appendix	Number of seized	Percent
Snow leopard	<i>Panthera uncia</i>	Vulnerable	Appendix I	2	8.00
Barking Deer	<i>Muntiacus vaginalis</i>	Least Concern	NA	10	40.00
Musk Deer	<i>Moschus chrysogaster</i>	Endangered	Appendix I	1	4.00
Kalij	<i>Lophura leucomelanos</i>	Least Concern	Appendix III	2	8.00
Pyura bird	<i>Perdix hodgsoniae</i>	Least Concern		2	8.00
Ghoral	<i>Naemorhedus goral</i>	Near Threatened	Appendix I	2	8.00
Huchil bird	<i>Bubo bubo</i>	Least Concern	Appendix II	1	4.00
Himalayan tahr	<i>Hemitragus jemlahicus</i>	Near Threatened	Appendix I	2	8.00
Munal	<i>Lophophorus impejanus</i>	Least Concern	Appendix I	1	4.00
Unidentified				2	8.00

The captured of wild fauna for illegal trading in Annapurna Conservation Area from 2011 to 2020 can be seen in Table 1. Among all the seized items wild fauna Barking deer was largely traded in ABC which was around 40% of the total seize. The most noticeable result was seizing of endangered species Musk deer trying to trade illegally in the Annapurna Conservation Area which was around 4% of the total captured species. It seems like the globally vulnerable species Snow leopard are also illegally traded in ACA as the total seize was around 8% of the total. Similarly, Himalayan thar was also being illegally traded which was 8% of the total fauna being seized in last 10 years; it is also near threatened species according to IUCN red list. The other species Ghoral which is also the near threatened species according to IUCN red list was also illegally traded. Likewise, other species Kalij, huchil bird, Munal bird and Pyura bird were also illegally traded in ACA. Among the illegally traded specie Snow leopard, Musk deer, Ghoral, Himalayan thar, Munal comes under CITES Appendix I. Huchil bird is listed on CITES Appendix II and Kalij is on Appendix III of CITES. All these species were poached inside the conservation area with the motive of earn huge amount of money.

Table 2: Wild flora seized in ACA between 2011 to 2020

Local name	Scientific name	IUCN Redlist	CITES Appedix	Number	Percent
Satuwa	<i>Paris polyphylla</i>	Vulnerable		9	25.71
Yarsagumba	<i>Ophiocordyceps sinensis</i>			5	14.29
Khada Rukha				1	2.86
Chap	<i>Michelia champaca</i>			1	2.86
Uttis	<i>Alnus nepalensis</i>			1	2.86
Pachhaaule	<i>Dactylorhiza hatagirea</i>		Appendix II	3	8.57
Tussa				6	17.14
Nirmasi	<i>Delphinium denudatum</i>			3	8.57
Black Satuwa				1	2.86
Jimbu	<i>Allium hypsistum</i> / <i>Allium przewalskianum</i>			1	2.86
Wood collections				1	2.86
Tunidhup				1	2.86
Wild Orchid				1	2.86
Bish	<i>Aconitum spicatum</i>			1	2.86

Table 2 show that the seized wild flora in Annapurna Conservation Area in between 2011 to 2020. The Table 2 shows that Satuwa was highest items seized for wild flora for illegally trade in ACA which was around 26% of the total. The other specie after Satuwa was Tusa which was 17.14% and then Yarsagumba with 14.29%. The species Pachhaaule was around 9% wich is listed on the appendix II of CITES and Nirmasi was 8.57%. The species Khada Rukha, Chap, Uttis were 2.865 for each from ACA but the motive illegal harvesting of these species was mostly for domestic use. The other species Black satuwa, Jimbu, Tunidhup, Wild orchid, Bish were also been captured along different kind of wood and wood products. Wild flora such as Satuwa, Yarsagumba, Pachhaaule and wild orchids were illegally collected from ACA for earning money through illegal trade whereas rest of the wild flora were collected for domestic use. All together 46 wildlife trophies were captured within 10 years period from 2009 to 2021 in ACA.

Figure 3 shows that 159 people were caught regarding the wildlife trade of 10 years from 2068 to 2077. It can be seen from the figure that number of people caught regarding wildlife trade increased drastically from 2013 to 2015. Thirty-six people were caught in year 2017 after that it declined in 2018 where only 20 people were caught after it slightly increased in 2019 where 27 people were caught. After that number of people caught declined steeply in 2020 where only 7 people were caught which was almost similar number to 2068 the starting year of this study.

Figure 4 shows the legitimate deed of illegal wildlife trade in ACA of 10 years from the year 2011 to 2020. Total 54 cases were filed in 10 years from ACA region out of which total decided cases were 33. It can be seen from the figure that many cases are still pending on the court.

Major themes identified from key informant interview

Service providers and officers working in conservation areas of wildlife and illegal trade identified five major themes, reflecting the protection of wildlife species: illegally traded wildlife species, major trade routes of illegal wildlife, motivating factors for illegal trade of wildlife species, coordination and cooperation between the stakeholders and law enforcement challenges of illegal wildlife trade.

a) Major illegally traded wildlife species in ACAP

Most of the informants agreed high altitude species are the major illegally traded wildlife in conservation areas such as Himalayan musk deer, Jharal, Himalayan Thar. However, one informant told wide varieties of wildlife are captured in the ACA. They reported that:

“Annapurna conservation region is mainly located in the Himalayan region of Nepal with cold climate and high altitude therefore species those lived in high altitude are killed and illegally traded from this area. The major illegally traded wildlife species are Himalayan musk deer, Himalayan Thar, and ghoral. One noticeable thing to remember is that the red panda, musk deer which is endangered and highly protected species in Nepal is also illegally traded from here, we have that proof. We heard that male musk deer is

traded for its musk pod which is used for making the cosmetics products such as perfume, and red panda skin is used to make jackets of the rich people and others animals skin parts for clothes and bags”.

b) Major trade routes of illegal wildlife

Most of the respondents were very aware of the major trade routes of the illegal wildlife, many of the respondents focus on the national and international route while one of the respondents focus on the local routes of the illegal flora trade. They reported that:

“The major route of the illegal wildlife trade in Annapurna conservation areas are a. Mustang to China b. Pokhara to Kathmandu to Sindupalchowk to China /Vietnam for the high valued species and their body parts. For the low commercial valued species, they are traded from Saradikhola to Pokhara and Sikles to Pokhara. Mainly external porters outside the district are used for transportation but they are highly coordinated and helped by local groups.”

c) Motivating factors for illegal trade of wildlife species

All the informants have similar views regarding motivating factors regarding illegal trade mainly focusing in socioeconomic and cultural factors. They stated that:

“The main factor of involving in the wildlife trade is because of the poverty and unemployment, most of the people involved in wildlife trade is to earn money. Further some people involved due to lack of awareness knowledge and punishable laws. Flora was also illegally collected by locals for medicine purpose of their livestock’s. Another major motivating factor is religious cultural and myths for example, owl is killed and kept in house to protect themselves from ghost. Some community people think that wearing jackets from animal skin is being superior and rich. However, some ethnic communities such as deep Buddhist help to protect wildlife species, they belief killing is a great sin.”

d) Coordination and cooperation between the stakeholders for the conservation of wildlife:

“All the respondents agreed that coordination and cooperation between the stakeholders plays the vital role in protecting the conservation of the wildlife’s. They stated that:

There is a good coordination between national trust of nature conservation, Nepal police, armed police force, community-based anti poaching unit, wildlife crime control bureau and local people. However, this coordination can be strengthened through modern resources and technologies. “

e) Law enforcement challenges of illegal wildlife trade.

According to the informants there many challenges for controlling the illegal wild trade in the regions. They state that: “The major challenge is topography itself; it is very difficult to go in high altitudes and cold weather in most of the year makes it impossible to work due to the lack of dedicated conservation armed force resources and sufficient funding. Moreover, porters used in illegal trade are very familiar and

trained for high altitude and geography compared to local informer and controlling forces. Further illegal wildlife trade is done in very organized way however the force is not that much organized to control it. Poor record keeping and mismanaged tourism of the country is also helping for the illegal wildlife trade in Nepal.”

Discussion

This study includes a 10-year (2011 to 2020) analysis of seized illegally wildlife in and around Annapurna Conservation area. Total 54 incidents were recorded in the last 10 years Pokhara is the headquarter of Gandaki Province and is hub for national and international trade, tourism and transit. As Kathmandu valley is usually considered as the major transaction of the trophies to different countries (Ghimirey and Acharya 2018; Bogati et al. 2021) but illegal wildlife trade through Pokhara cannot be neglected. The maximum number of captured has been around Pokhara Metropolitan City which is because of various checkpoint around Pokhara. The majority of poachers those were arrested in Annapurna conservation areas were arrested from Pokhara, the second biggest city of Nepal which has large number of internal and international tourist. All together 46 wildlife trophies were captured within 10 years period from 2066 to 2077 in ACA. Out of these 38 trophies. Total of 338 cases related to IWT were recorded in Kathmandu valley from 2008 to 2018, out of which total decided cases were 212 (Bogati et al. 2021) and result from this study shows the above shows the similar trend in ACA region, total 54 cases were filed in 10 years out of which total decided cases were 33. Moreover, according to the in-depth interview some Non-government Organizations (NGOs) such as WCN, WWF Nepal Program, National Trust for Nature Conservation, Central Zoo, Bird Conservation Nepal, and Roots and Shoots Nepal had also helped Nepal Police and District Forest Offices with sharing of field intelligence and wildlife rescue.

Study found that a wide range of species is targeted by illicit trade including some globally threatened species such as a snow leopard IUCN red list recorded it as vulnerable animal and musk deer IUCN red list recorded it as endangered animal. Snow leopard and musk deer are among the prioritized nationally protected species. According to the laws of Nepal if convicted, the penalty for killing, harming, and buying or selling trophy of those species is a fee of fifty thousand to one hundred thousand Nepalese Rupees (~ USD 500–1000) or imprisonment of five to fifteen years or both.

Among the illegal trade in wildlife, trade of bird is also a great concern for biodiversity conservation. This study found that different types of bird body parts were illegally traded and captured in the ACA. Kaliz, Huchil Munal, Huchil bird were among the birds that were illegally traded and captured in the Kaski district. Many studies including bird conservation Nepal also found that Nepal is being the fertile ground for illegal bird trade, (BCN & DNPWC 2011; Dhakal & Subedi 2014).

Upreti et. al. (2021) identified the following for illegal wildlife trade in and around the Kailash Sacred Landscape and causes for illegal wildlife trade were identified as

a) demand for illegal wildlife items mostly in China,

- b) limited other livelihood, opportunities for local people,
- c) open or porous borders,
- d) weak patrolling due to limited resources, and
- e) ineffective law enforcement

However, this study has identified the main factor of involving in the wildlife trade in this region is because of:

- a) the poverty and unemployment, must of the people involved in wildlife trade is to earn money.
- b) lack of awareness knowledge and punishable laws.
- c) religious cultural and myths for example, owl is killed and kept in house to protect themselves from ghost.
- d) Superiority and show off.

Capturing the wildlife body parts is just the tip of the iceberg as only potters and low-profile smugglers are arrested in real wildlife trade happened underground, (Felbab-Brown 2011). It is very clear that the illicit wildlife trade is organized and being operated by effective networks. Layers of networks exist in the illegal wildlife trade in the country, which range from local poachers to intermediary and international smugglers. Organized criminal syndicates are involved in international wildlife trafficking and poaching (Wyler & Sheikh 2013). It seems that the majority of people involved in the wildlife crime live in proximity to protected areas and larger cities. This study also found that the majority of poachers those were arrested in Annapurna conservation areas were from Kaski district which have the second biggest city of Nepal Pokhara with large number of internal and international tourist.

Effective law enforcement is necessary for combating illegal wildlife trade globally, and a solid legal basis is crucial for it (Vasquez 2003). The major challenge seen in ACA region was rugged topography consists of in high mountains and extreme cold weather which makes it impossible to do patrolling work throughout the protected area. Moreover, potters used in illegal trade are very familiar and trained for high altitude and geography compared to local informer and controlling forces. Nepal have signed and developed many laws nationally and signed Convention on International Treaty in Endangered Species of Wild Fauna and Flora to address the illegal wildlife trade. Nepal has formulated many acts and regulations to protect wildlife species in their natural habit starting from 1957 as wildlife conservation act enacted. After that Nepal also enacted aquatic life protection act after 5 years and signed Ramsar convention for wetland conservation and famous CITES in 1976. After that many series of conservations strategy, declaration of national parks and conservation areas for protecting the wildlife and biodiversity has been done in Nepal. Most importantly, recently CITES Act, 2073 and CITES Regulation, 2076 also entered into force for the regulation of trade of rare and endangered species in Nepal.

Conclusions

Study confirms that illicit international wildlife trade networks for a number of rare species those are cited in Appendix I of CITES and endangered categories of IUCN red list exist in Annapurna conservation areas. The study also shed light on the complex dynamics surrounding such activities in Protected areas. The finding revealed that significant number of trophies of globally threatened species such as snow leopard, musk deer goral, himlayan tahr along with very important and valued flora such Yarsagumba and Pachhaaule were seized suggesting an urgent need to focus on local and national circumstances that drive trade. It shows that the trend of trade is very sensitive to major protected species and also endangered species. Police should focus on breaking network of high-level traffickers and highly organised criminal syndicates rather than focusing only on porters. It is necessary to implement the laws and treaty effectively to reduce illegal wildlife trade. There is an urgent need of increased community awareness and participation in conservation, capacity strengthening of conservation organizations and reductions in rural poverty that, together could be effective over the long-run as people.

As study highlighted that the majority of the illegal trade was localized in Pokhara City of Kaski district therefore greater vigilance in trade and business routes (e.g., highways and airports) connecting Nepal's business centres and Nepal's neighbours should be of urgent priority. It is crucial to strengthen the check post in major local routes along with major international route bordering China to discourage IWT activities within ACA. The study also found increasing trend in the number of individuals caught for this illegitimate deed. Moreover, there are significant number of pending cases which indicates a serious need for improving legal process. The poverty and unemployment, lack of awareness knowledge and punishable laws, religious cultural and myths, along with the superiority complex were identified as the major factor for people involving in such trade. To achieve sustainable conservation, collaborative initiatives between communities dwelling in and around ACA region, NTNC and related stakeholders is recommended to be developed. These initiatives can improve income generation and support conservation programs. Programs for raising the public's awareness and enhancing the understanding of relevant stakeholders regarding legal, social, economic, and environmental impacts of the illegal trade needs immediate implementation in ACA region.

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Figures

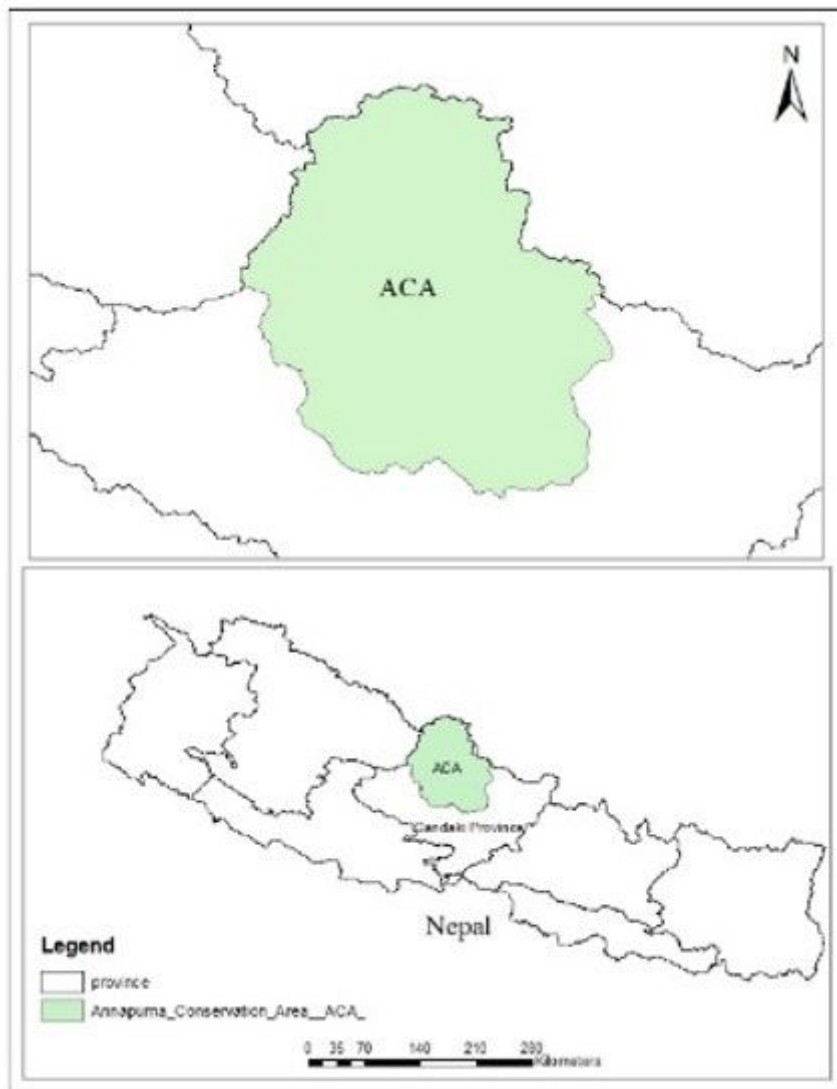


Figure 1

Study Area



Figure 2

Point of trophies captured in ACA

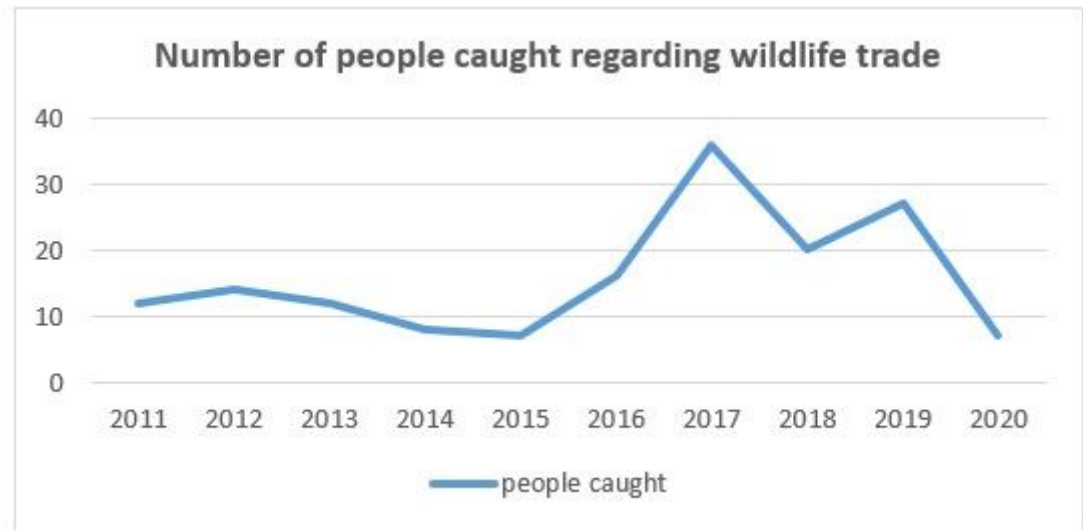


Figure 3

Involvement of persons in illegal wildlife activities in ACA

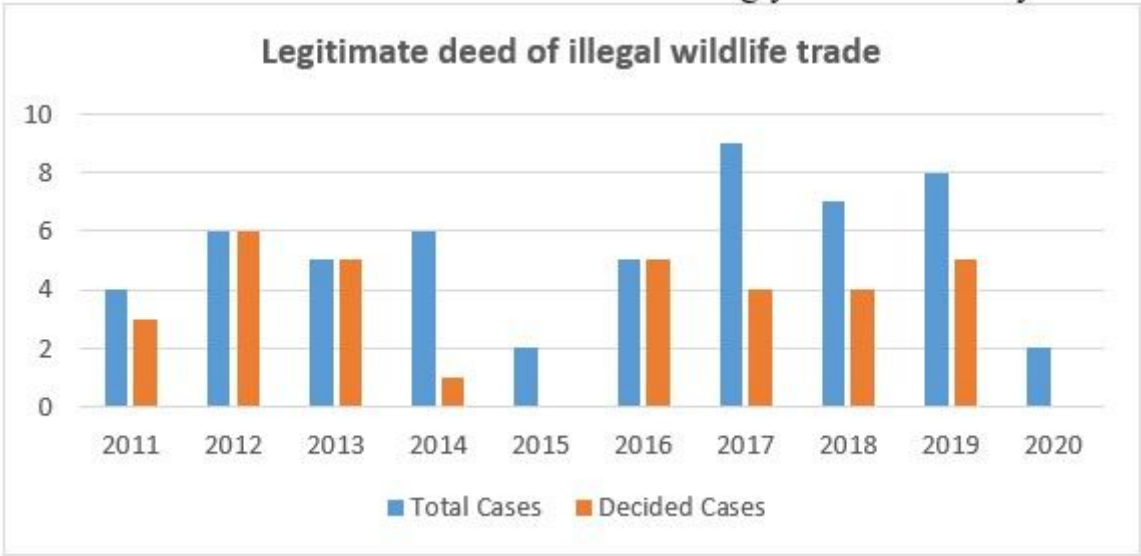


Figure 4

Legitimate deed of illegal wildlife trade in ACA