ASSESSEMENT OF WILD BOAR (SUS SCROFA) DAMAGES IN PROXIMITY OF CHIR PINE (PINUS ROXBURGII) SHINKIARI FOREST RANGE OF SIRAN FOREST DIVISION DISTRICT MANSEHRA KHYBER PAKHTUNKHWA PAKISTAN

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ABSTRACT

The main objective of the study was to assess the damages caused by wild boar to the sub-tropical chir pine forest. The study was carried out in May and June 2022. The presence of wild boar in the study area was assessed by different signs, pug marks, hairs, and burrows of the animal. Moreover, the line transect method was used for the collection of data. Transect line of 6.5 km was laid down in the study area and data was collected up to 50m on either side of the transect line . The measuring tape was used to calculate the damages caused by wild boar to the regeneration of chir pine forest. The damages which are affected by the wild boar are seedlings (54.59%), saplings (35.81%), and poles (9.6%). The seedlings of chir pine forest were highly damaged followed by saplings and poles. The present study shows that seasonal variability migration, disturbance in the food chain, and decline of prey affect the wild boar distribution. Total of 20 damaged sites were encountered directly while 15 sites were reported during the interview by the community in the study area. The data regarding the damages caused by wild boar in different areas was collected from total 272 respondents and the result revealed that the wild boar mostly damage the agricultural crops followed by forest crop, biodiversity, domestic animals and human. The assessment in this study also revealed the fact that wild boar also damage the fertile soil of forest floor. Finally the study also brought out some local management strategies for wild boar i.e. tracking dogs, usage of high intensity sounds, electric wires and different chemicals. This stud also recommend precautionary measures for the mitigation of wild boar conflicts with human beings, and agriculture crops.

Keywords: Wild boar, Damages Assessment, Chir Pine Forest, Shinkiari Forest

1. INTRODUCTION

The wild boar (*Sus scrofa*) (Linnaeus, 1758) is an ungulate species belong to order Cetartiodactyla with suidae family, representing seventeen subspecies of wild boar (Massei and Genov, 2004, IUCN 2019). There are different names of wild boar according to locality e.g. in Pakistan mainly Punjab and Khyber Pakhtunkhwa, it is known as the "Barla", "Jangli Soowar", "Soor" and "Khanzeer", while in English "Feral Hog", "Wild Boar" and "Eurasian Wild Pig" referred commonly. Chronologically the domestic pigs are the nearest ancestor of the wild boar (Choi *et al*., 2014).

The wild boar is widely distributed species of the mammals and inhabiting in a wide range of habitats in all over the world (Pittiglio *et al*., 2018). It has largest geographic range among all the terrestrial mammals and in mainly throughout the North Africa, Europe and in Asian region (Choi *et al*., 2014). It is native from Northern Africa and Western Europe, and now it is extending South-East Asia to Japan, Java, Taiwan, Sri Lanka, Malaya and Korea (Choi *et al*., 2014).

Highly adoptive nature in almost all types of environments and high reproductive rate of wild boar make their survival rate high and distribution in all over the world (Ashraf *et al*., 2013). The wild boars prefer to live in swamps, mountainous areas, marshlands, deciduous and coniferous woodlands, coastal zones, edges of rivers, in the moist temperate forests and the shrubs land (Ashraf *et al*., 2013). The wild boars have quite adoptive morphology to survive in extreme environmental conductions (Schley and Roper, 2003). Similarly, wild boars are also successfully adopted in the dry and tropic regions of the world including Australia (Ashraf *et al*., 2013).

The wild boar is a hyper omnivore and feed on variety of feeding material depending on the availability of food and the seasonal variations (Crooks, 2002). The diet or the feeding strategies of a species helps to understand the biology and the habitat preference of the species (Schley and Roper, 2003). The habitat preference of wild boar depending on the availability of feeding materials and climatic conditions (Cuevas *et al*., 2016; Schley and Roper 2003). The plant (leaves, seeds, fruits, tubers) are the main food items (87 to 99%) of the wild boar (Crooks, 2002).

The wild boar is a significant agricultural pest that has a significant economic impact losses to the agricultural crops such as wheat, maize, rice, grapes, barley, oats, rye, and

potatoes etc. (Schley and Roper, 2003; Giménez-Anaya *et al*., 2008). Similarly, rooting behavior reduce the seedling density, leaving the soil bare and damaged, also alters the natural fauna of the soil and makes soil easily erodible (Bártová *et al*., 2006). It affects the animal populations also as it feeds and prey on different vertebrates such as carcasses, small rodents, reptiles and amphibians, pheasants and partridges, invertebrates including (insect pests, earthworms, sawflies and moths) as the dietary part of the wild boar (Masterson, 2007).

2. Material and Method

Study Area

District Mansehra is situated in Pakistan's Khyber Pakhtunkhwa Province's Hazara civil division. Its coordinates are 720 -49' and 740 -08' east longitude and latitude of 340 -14' to 350 -11' north. It consists of the tehsils of Mansehra, Balakot, and Oghi. The district has been blessed with high mountains, lakes, picturesque valleys, plains, and more specifically, a rich and harmonious combination of tall and majestic fine trees. It has an area of 5959 km2 (Shah and Khan, 2006). The same mountain system extends to the mountains on the northern side as well. Musa-ka-Musala is a peak that can be seen from the northeast and is located on the northeastern side of the Konsh and Bhogarmang valleys. Its elevation is 4080 metres (Mustafa, 2003). There is a well-known black mountain range that stretches northward on the western side of the Agror valley (Oghi) (Mustafa, 2003). The district experiences seasonal periods of rainfall, snowfall, and drought in a humid and temperate environment (Mustafa, 2003). The district's forests are abundant with trees including Deodar, Blue Pine, Chirr, Walnut, Cherry, Poplar, and Kao (SMEDA, 2009), and during the monsoon season, they sustain a wide variety of macrofungi.
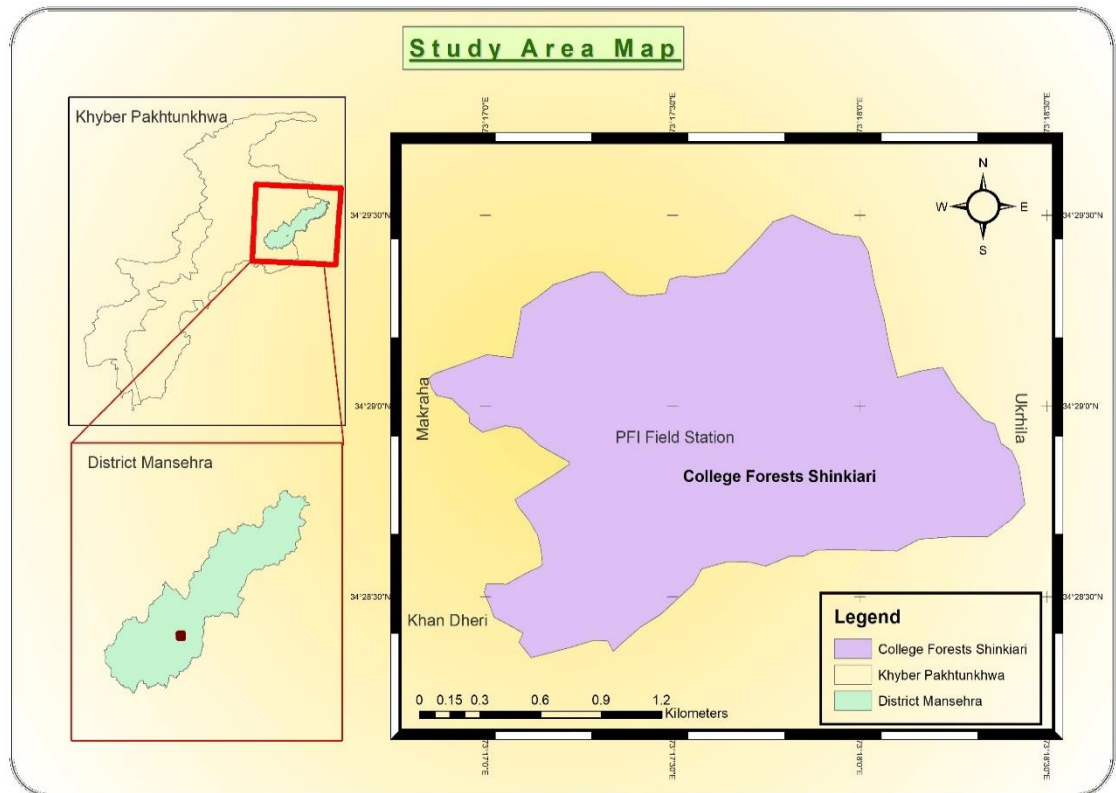
Figure No 1. Map of District Mansehra Shinkiar

Study Design

Distribution

To determine the distribution of wild boar in district Mansehra Shinkiari, the census was conducted from November to December 2021. Frequently field visits were carried out during study time. A preliminary survey was conducted in May-June 2022 in which the distribution of wild boar was discussed with authorized authorities that were DFO, SDFO, and RFOs of the Forest and Wildlife Department, We also take data as secondary data from the local people of that area.

Line transect

Line transects were employed to cover all chir pine damage in the research area. Transects in the research region represent nearly all study areas. Transects begin near Shinkiari Field Station. Early morning and evening were surveyed because that was when most hog species were active. Irregular daylight surveys were also done to observe the studied species' signs (pug markings, dead corpses, hair, faeces, and burrows) and behavioural activities. Full-hearted surveys were conducted. Observing the wild boar's

movements helped. We saw a wild boar with his piglets in the morning, indicating the population is higher there.

Using binoculars (A211 2050) and a digital camera, observations were made. During the line transect study, habitat, physical features (elevation, erosion, water channel, burrows, etc.), and weather were studied. Species signs (hairs, faeces, dead bodies) and physical appearance were observed along the transect.

Damage Assessment

Using a measuring tape, damage was surveyed. DFO, SDFO, and wildlife observers visit these locations. The chosen areas were visited in May and June (2022). Wildlife department-guided wildlife observers visited the areas. We assessed uprooting, soil, sapling, and seedling damage, and bark damage. We took images, recorded data, and GPS coordinates. Wild boar damage was assessed in random regions. We take transects up to 12 and 13 and see distinct wild boar damages based on region and geography. The study region was covered by 13 transects. Each transect line is 500m long and 50m wide. Maximum damage was calculated in chir pine-dense areas. All settlements were damaged by wild boar since their resting locations are in highlands and inaccessible to locals. Unpermitted hunting in chir pine woodland Shinkiari was another factor. Well-trained canines kept wild boar away from their crops. We came when there was more regrowth in that area, but a forest fire uprooted chir pine saplings and poles. In that chir pine forest, there are more wild boars than forest fires.

3.   Result and Discussion

Damage cause by wild bore

As we can see from the below table the damages caused by wild boar are mainly poles, saplings, seedlings, and our assessment of damages is mainly only on chir pine crop, so from the graph we calculate some values which in the form of frequency, percent, a valid percent, cumulative percent, so from here we only take frequency that how much damages is done in that particular area where we take transect line, so the frequency of pole crop is up to 22 trees were damages in the study area. The saplings damages in that particular area were 82 number of chir pine crop, this is on the second number which was damages highly and the more highly damage crop of chir pine is a seedling which having the damages up to 125 in number, so we can get the result from the graph that the

damages which were caused by wild boar its shows the interest of wild boar or which can be easily damaged that is seedling on second preferred one is sapling and if this two is not available due to forest fire so it damages the pole crop, so overall frequency is 229 crop of chir pine.

Table 1 Damages Caused by Wildboar in Chir Pine Forest

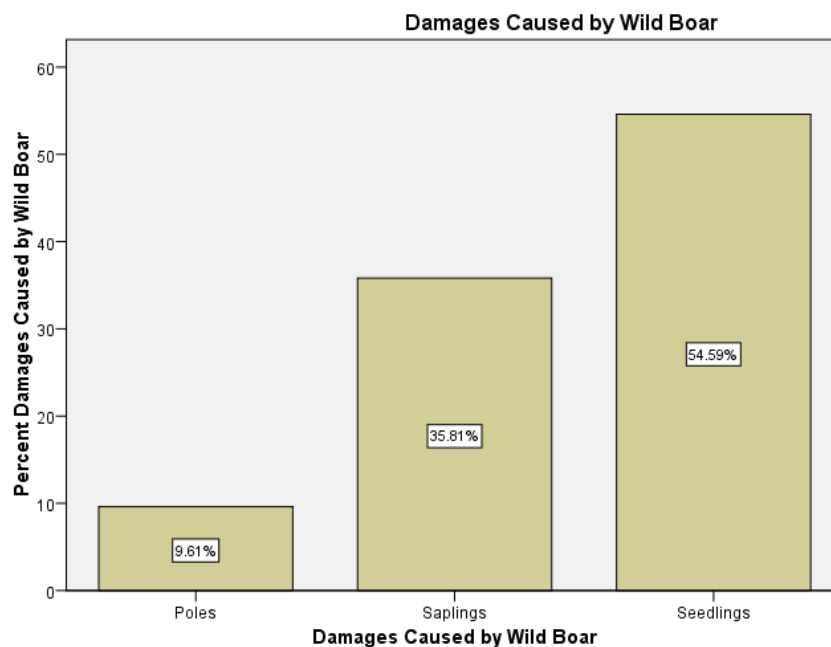|		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poles	22	9.6	9.6	9.6
	Saplings	82	35.8	35.8	45.4
	Seedlings	125	54.6	54.6	100.0
	Total	229	100.0	100.0	

Figure No 2 Damage cause by wild bore

As we can see the Bar graph shows that there is some damage which is caused by wild boar in percent so 54.59% of damage crop is seedling in that particular area and the second damages which are caused by wild boar are the sapling that is 35.81%, and the fewer damages or less approach of wild boar towards pole crop is 9.61%. All this is told by a bar chart.

During our study, different stakeholders were taken on the board to investigate the distribution and abundance of wild boar in the chir pine district of Mansehra. The respondents were selected from all types of stakeholders including farmers, government employees, forest & wildlife staff, shepherds, and local villagers to collect the data for a better understanding of the wild boar presence in a sub-tropical chir pine forest (Fern 2020)

Sighting Record of Wild Boar in District Mansehra shinkairi

During secondary data information on the presence of wild boar in District, Mansehra Shinkiari was collected. The 30 respondents answered that the very first time they sighted wild boar in between 2008 to 2022 which shows the adaptability of this problematic species in the study area. The other respondents reported sighting this invasive mammal onward from 2014 to 2021. Now the species is widely distributed in the whole area, posing alarming threats to local biodiversity and agriculture fields.
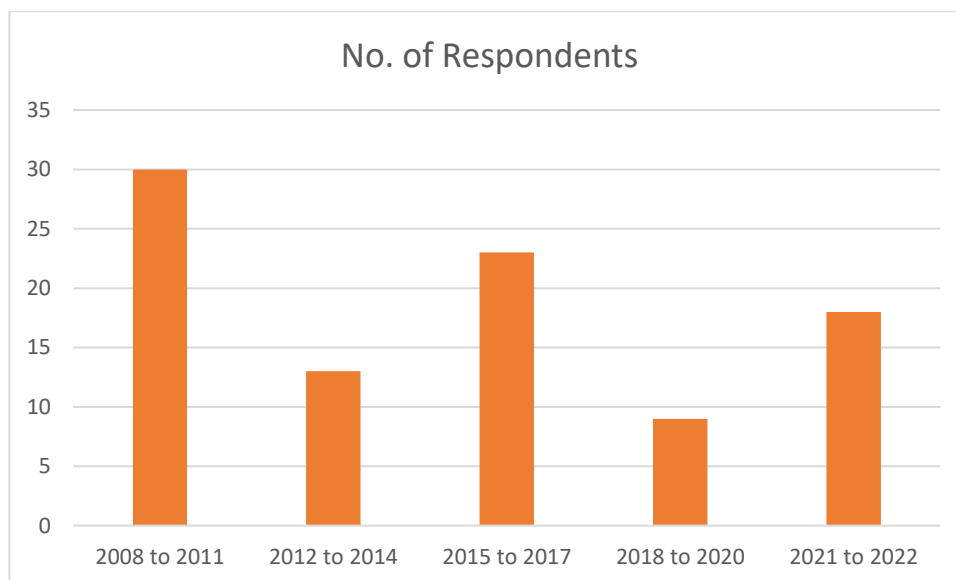
**Figure No** 3 **The first sighting record information of wild boar in District Mansehra Shinkiari**

Sighting Location of Wild Boar

The highest number of wild boar was reported from agricultural land (47%) followed by forest area (35%) and the remaining sightings record were reported randomly. All the respondents provided the sighting of wild boar concerning their activities type, activities time, and the area they travel to on daily basis. The availability

of food resources influenced the distribution and occurrence of wild boar in any type of habitat (Massei and Genov, 1995a).

Time of Sighting of Wild Boar

With the help of secondary data, we asked respondents about the time when they sighted the species. The majority of respondents (40%) sighted the wild boar at night, followed by evening (33%) and morning (16%) time. Due to the nocturnal behavior of the species, only 11% of respondents reported sightings of wild boar during the daytime. Although it is not pure nocturnal species, the major activity period of this species is at nighttime. People reported the attacks of the wild board on crops at nighttime. Chauhan *et al.,* (2009) studied the time of attacks by wild boars, he documented 251 cases in different states of India, and the majority cases were recorded at nighttime.
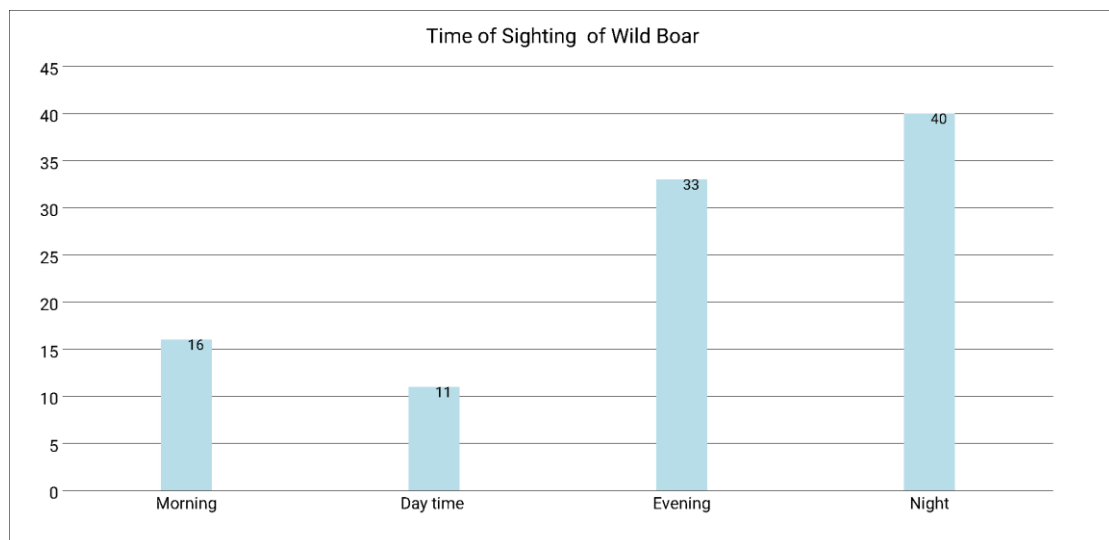
**Figure No** 4 **The time of sighting of the wild boar by respondents in the study area.**

Damage Assessment of Wild Boar

Secondary reports on wild boar damage assessment and photographs of pug marks and crop damage were acquired. Subtropical chir pine seedlings, saplings, and poles were damaged. 86% of respondents said wild boar damage agricultural fields and crops, causing economic loss. Due to economic losses caused by wild boar, rhesus monkeys, and porcupines, many people living near forests avoid growing crops and vegetables. Wild boar caused $2.5 million/year in economic loss. Wild boar's presence influences the population dynamics of other wildlife species since it eats corpses, small rodents,

reptiles and amphibians, pheasants and partridges, and invertebrates such as bug pests, earthworms, sawflies, and moths, etc (Choquenot et al., 1996; Masterson, 2007). Wild boars damage and destroy habitats through rooting, eating endemic species and plants, and reducing plant cover (Massei and Genov, 2004).

In the research region, wild boars have attacked cattle, poultry, and people. Feral pigs are one of the "100 worst invasive alien species in the world" according to the World Conservation Union's Invasive Species Specialist Group (IUCN) (www.iucngisd.org/gisd/search.php). They harm crops, prey on livestock, reduce crop productivity, and pollute water (Masterson, 2007). Wild boar threatens the local people and natural resources, hence the source population must be reinvestigated and strong steps must be adopted to slow its dissemination.
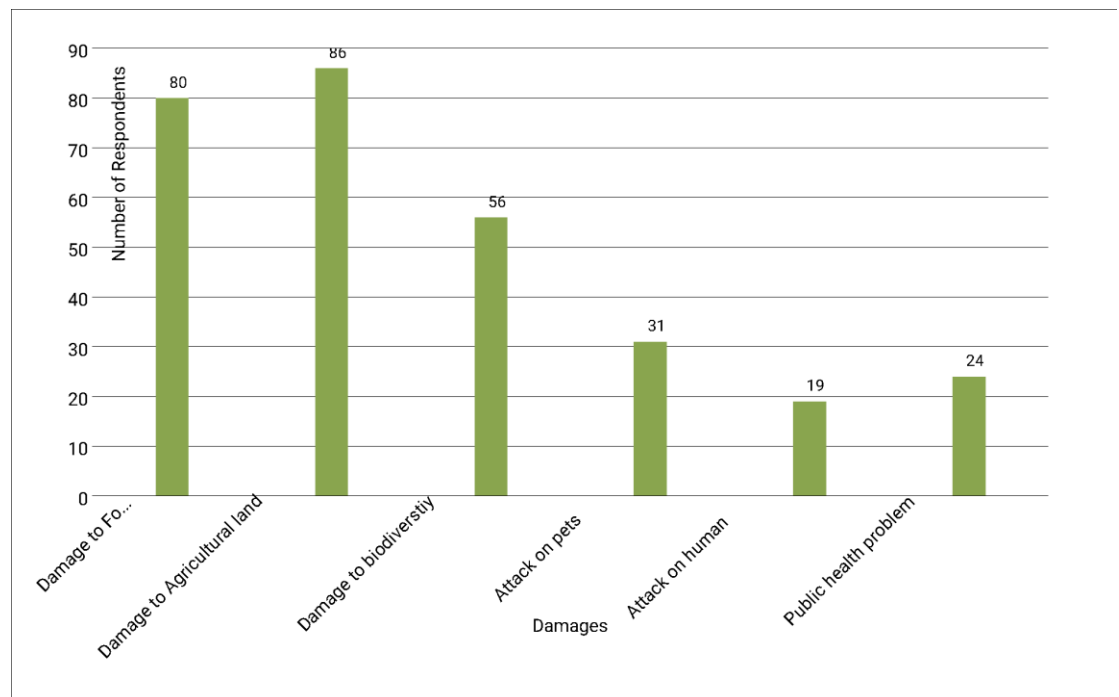
Figure No 5 **Some other Damages caused by wild boar District Mansehra Shinkiari**

The people used to catch dogs 47% because it is a cheap method 22% done nothing about controlling wild boar 21% used sound producing of different things using patakha bombs himself sounds and pots. Hunting was allowed in open areas peoples use to hunt for fun. 7% used electric wires at night time in low human interference sides and 5% used

different types of chemicals. The wildlife department and local community were not properly aligned.

Increased hunting pressure to reduce populations would appear to be a useful management approach, according to earlier studies (Bieber and Ruf, 2005; Servanty et al., 2008). According to research by Mazher Abbas et al. (2004), nearby wild boar habitats should be changed such that the animals find them unsettling places to hide. So that water cannot stand in the canals for the wild boars to drink, they are made clean and level. Five game reserves and the wildlife department's prohibition against killing or controlling the wild boar population are additional factors that contributed to the enormous increase in the wild boar population in the study area.

Figure No 6   Management strategies by respondents in the District Mansehra Shinkiari

4.   Conclusion

The primary data showed that wild boar is distributed in all sub-tropical chir pine forests. Due to increasing trends in its population, it has created a conflict with biodiversity. Our data showed that seasonal changes affect the abundance of wild boar, its habitat suitability, and the prey. Mainly wild boar effect on the flora in his rutting season. There is a proper need for management plan strategies to control the population of wild boar with scientific principles. It has been concluded that disturbance in food change due to climate change affected the wild boar thus its migration, distribution towards papulation, and villages cause serious damage to crops and livestock. The data

documented in this thesis will be used for wildlife management to mitigate the wildlife conflict between the wild boar with the human being. Proper legal harvesting of wild boar through trophy hunting can be the source of revenue and population dynamics in the ecosystem.

5.   Recommendations

Based on field observation and outcomes of this study followings are the recommendations of this study:

- Time requires to start appropriate steps to manage and control the fast-growing population of wild boar.
- There is a need to assess and monitor the damages caused by wild boar on the sub-tropical chir pine forest in district Mansehra.
- In order to lessen the strain on the wild boar population, techniques including ground-trapping, coordinated harvest by trained teams, hunting with dogs, and aerial hunting should be taken into consideration.
- To control the population of the wild boar the areas must be managed by waste management and wildlife authorities to minimize crop damages.
- All the stakeholders and conservation agencies should extend cooperation to raise awareness about the wild boar and its significance In the ecosystem. which in turn will encourage their motivation for biodiversity conservation.
- There should be made such strategies to avoid conflict between farmers and wild boar.
- GIS tool may be used to know the distribution of wild boar and mapping of its damages.
- We must conserve the predator of wild boar to minimize the population of wild boar.

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