Study of targeted Bird species posing threat to Aircrafts at Bacha Khan International Airport, Peshawar

Arz Muhammad Umrani[1], Ahmad Zamir[1], Umair Safdar[1],Mamoona Wali Muhammad[1], Muhammad Sajawal[1], Sohaib Ahmad[1], Imtiaz Ahmad[1] ,Zahid Rauf[1], Syed Talha Kamil[1], Aimal khan Barki[1]

1) Pakistan Forest Institute Peshawar
Corresponding Author: Arz.forest87@yahoo.com

Abstract:
The purpose of this paper is to study hazardous birds around airport. The study is based upon eight sites around the airport in 5-kilometer radius of the airport. The sites were University road, Tambvano Mor,Tehkal, Gora qabristan, Mall Road, Bara Road, Old bara Road, Abdara Road. As per the Airport Officials the concerned species were Kites, House crows, Pigeon, Common Mayna, House Martin, Black Drongo, Red Vented bulbul, Sparrow. Mostly sites were observed with dominant features including hotels, commercial areas, open garbage dumps, butcher shops etc. The birds were observed around airport housing societies, buildings, tall tress which can create possible potential threats to aircraft operation. House crow and kites were distributed in all sites. The Population density of eight concerned species were as: Kites (45%), Crow(20%), Red Vented Bulbul(10%), Pigeon(6%), Dove(9%), Sparrow(4%), Drongo(4%), House Martin (2%). The roost of crow and kite were seen in Mullbery, Eucalyptus, White siris, Dalbergia Sisso, Populus, Black Siris. Kites and crows' nests were observed in tall trees. Dove and pigeons were seen resting over telephone towers, fences, building etc. Kites and crows were observed on boards and logos at the top of airport building. Concerned authorities mostly focus inside the airport than off airfield. The outside premises of the airport should not be ignored. Most of the sites are directly under flight path. Result indicate that habitat near airport is highly conducive for birds and can be serious threat to aircraft operations. The study will be useful for airport management for outside bird management program.

Key words:
Target Species, Bacha Khan International airport, Bird Management Program, hazardous birds, Peshawar

Introduction:

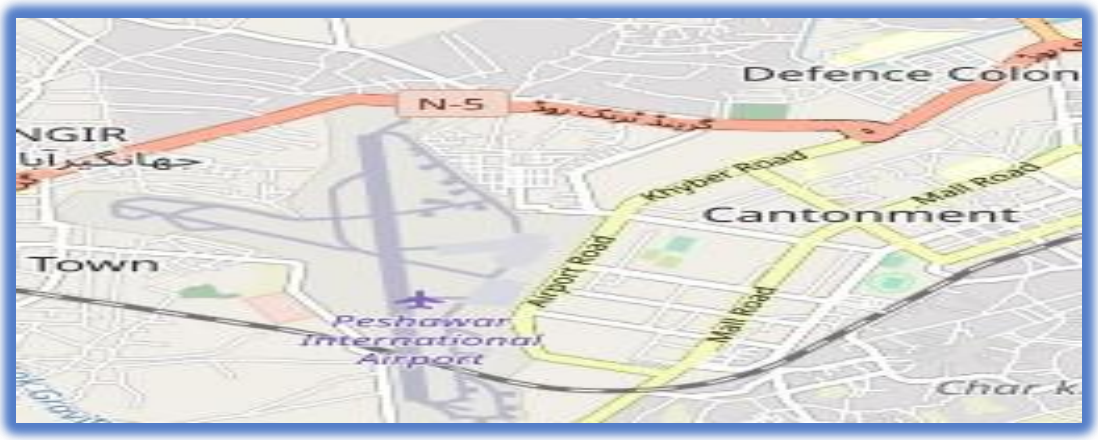
Witmer and Fantinato, (2003) have reported that in USA, raptors in particular, are hazardous to aircraft safety due to their size, hunting behavior, and hovering or soaring habits. Similar studies have also been conducted in South Asia. Upadhyaya and Dolbeer, (2001) reported that raptors such as kites, eagles, vulture and falcons were the main hazardous species at Tribhuvan International airport, Katmandu Nepal. According to Civil Aviation Authority Pakistan kites are also becoming problem at many airports in Pakistan. and Human lives and aircrafts have been affected by collisions. Many studies have been conducted to analyze civil & military bird strike database all over the world *(Dolbeer and ES chenfelder,2003).* The International civil aviation organization (ICAO) Requires airport to implement measures to decrease the risk of wildlife hazard at and in the vicinity of an airport (*Merchant et al* 1990). Several studies were conducted by Sugg (1965), Meads and Carter (l973), Major and Dill (1978), Mudge and Fems (1982), Horton (l990), Milsom (l990), Pomeroy and Hepner (1992), Hild (1995), Demarchi (1996), Ferns (l996), Seubert (l996), Vantets (l996), Primus and Furcolow (l997), Hahn (1997), Dolbeer et al., 1998), Hild and Muentze (2000), Baxter (2001), Hild (2002), Burma (2003) Hild and Morgenroth (2004), Hahn (2004) and Martin et al. (2011) on roosting of birds near air fields and their effect on air craft flights safety. Bird strike is at highest at low height and decrease with height (EASA. 1999-2008, Dolbeer, RA; Begier, M.J.;Miller, P.R.;Weller,J.R; Anderson,A.L. 1990-2018). Annual loss to US civil aviation due to wildlife strike (98% involving birds) have been estimated to at least 677 million dollars. (*Richardson and west 2000)* have reported 286 serious bird strike, accidents to military aircrafts from 32 countries during the period 1959-1999. Birds air strike crash may cause many loss(Godin, 1994). According to Civil Aviation authority CAA Pakistan 85 incidents of bird's strike took place only at Alama Iqbal International Airport Lahore Pakistan since 2002. Knowledge about hazard species give clues about size, behaviors, breading and feeding patterns of the problematic species and hence preventive measures could be taken accordingly. As all birds are not hazards to aviation. Therefore, it is important to identify these species of conflict and factors responsible to attract birds near airport or airfield. There should be Wildlife control unit activity including pilot and controller in loop. Over the years collision between birds and the aircraft has resulted in the death of hundreds of people and is responsible for annual loss wort about 1.2 billion US dollar.

Method and Material:

Data on bird species and number were collected from eight different sites. The sites having commercial habitats including buildings, hotels, tall trees, dumping points were considered vantage points for data collection through point call method. Number of the individuals of each bird species falling within 50-meter radius were observed. Each site was visited for 2-3 hours. While travelling between points species were recorded between dawn and dusk. Binoculars (Servoss et al 2000) were used during the observations to confirm the identification of different birds' species which were not clear with naked eyes *(servoss et al,2000).* All the activities of flying, loafing, nesting, feeding, breeding was recorded. Secondary data was also collected from civil aviation authorities.

Study Area

Bacha khan International Airport (Peshawar Airport) is situated in the middle of Peshawar city. The airport was established in 1927 and received international status in 1965. The coordinates of the study area are 33.9898° N, 71.5192° E. the airport is spread over an area of 7.5 Acres. In the recent times airport have improved with infrastructure facilities both passenger and cargo airlines services.



Results:

Table 1. Study Areas and their Characteristics

S.No	Study Sites	Aerial distance from Airport (meters)	Concerned Species Observed	Habitat Characteristics
1)	University Road	358	i. Milvus migrans ii. Corvus iii. Columba iv. Acridotheres tristis	Hotels, Saplings, Shrubs, Buildings, restaurants etc
2)	Tambvano Mor	10	i. Spilopelia senegalensis ii. Passer domesticus iii. Corvus iv. Red vented Bulbul v. Milvus migrans	Fuel Pumps, Workshops, Hotels, Trees, Garbage Dumps etc
3)	Tehkal	383	i. House martin Swift ii. Columba iii. Spilopelia senegalensis iv. Milvus migrans v. Corvus	Buildings, Houses, Lawns, Garbage Dumps, Water sources etc

4)	Gora qabristan	1877	i. Passer domesticus ii. Dicrurus iii. macrocercus iv. Milvus migrans Corvus	Buildings, Flowering areas, Houses, Trees etc
5)	Mall Road	1178	i. Milvus migrans ii. Corvus iii. Columba	Old trees, Shrubs, Buildings, Houses, Offices etc
			iv. Acridotheres tristis	
6)	Bara Road	36	i. Passer domesticus ii. Dicrurus iii. macrocercus iv. Milvus migrans Corvus	Shops, Restaurants, Butcher shops, workshops etc
7)	Old bara Road	40	i. Spilopelia senegalensis ii. Red vented Bulbul iii. Corvus iv. Milvus migrans	Shops, Butcher shops, workshops, Garbage dumps, Houses, dumping grounds etc
8)	Abdara Road	19	i. ii. Corvus iii. Milvus migrans Passer domesticus	Houses, plazas, Buildings, plaza etc

Attractants Around Bacha Khan International Airport:


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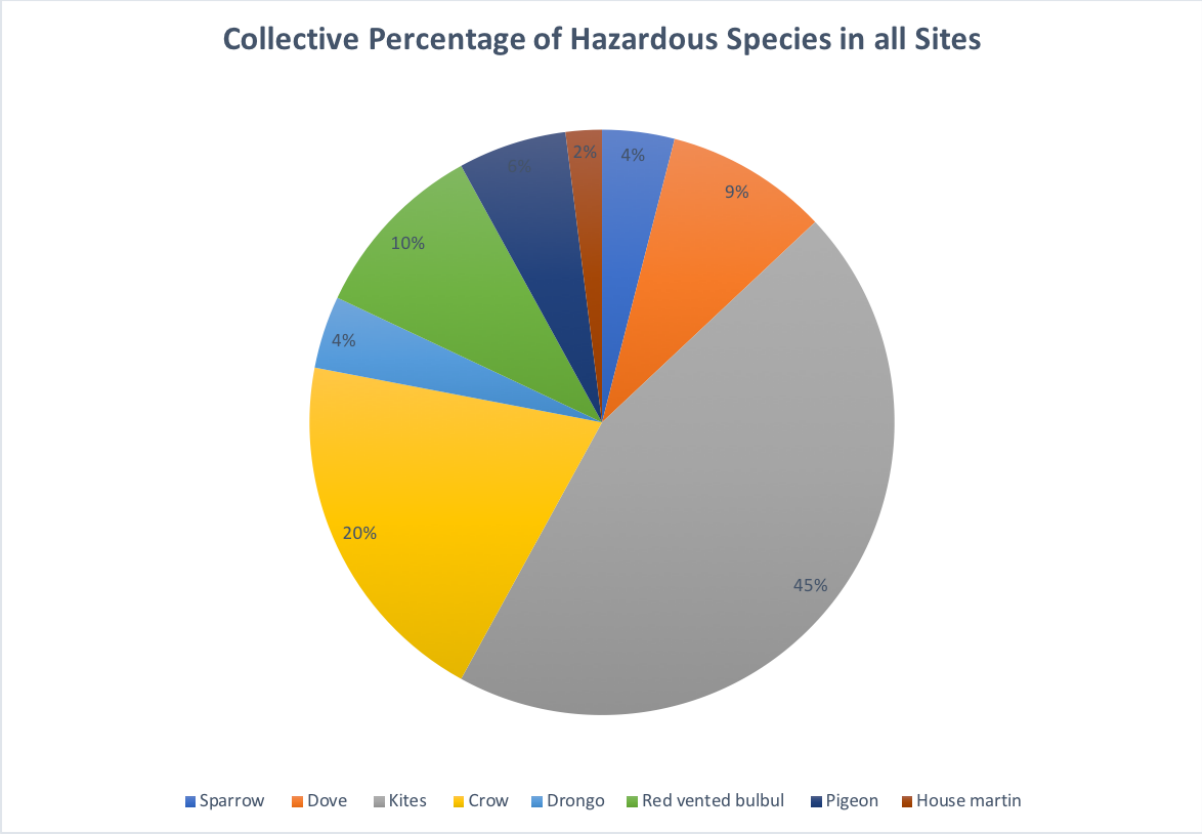
Figure 1: Collective Percentage of Hazardous Species in all eight Sites



Discussion:

House crow and kites were distributed in all sites. The Population density of eight concerned species were as: Kites (45%), Crow(20%), Red Vented Bulbul(10%), Pigeon(6%), Dove(9%), Sparrow(4%), Drongo(4%), House Martin (2%). The roost of crow and kite were seen in Mullbery, Eucalyptus, White siris, Dalbergia Sisso, Populus, Black Siris. Kites and crows' nests were observed in tall trees. Dove and pigeons were seen resting over telephone towers, fences, building etc. Kites and crows were observed on boards and logos at the top of airport building. Common Mayna were observed in grassy fields and black drongo were also seen on electric poles and trees. Most of the Bird Strike in USA takes place in surrounding of airport during landing and take-off phase. So, it's necessary for better management of outside area of the airport and identify factor which contribute in Bird strikes. Pakistan is a member of ICAO International Civil Aviation Organization and has an obligation to adopt necessary measures for discouraging birds around airport. Our national legislation also prohibits any activity that attract birds within 8 kilometer around

the airport. We all work together in unity to ensure public safety of all those who travel in Pakistan Fly zones.

Reports released by Pakistan's Civil Aviation Authority (CAA) and Pakistan International Airlines (PIA) point to bird strikes as a growing danger at the country's airports. In the first six months of 2022, 30 aircraft belonging to flag carrier PIA were struck by birds at various airports dotted throughout the South Asian country. In total, 48 planes of national and foreign airlines were affected by bird strikes up to May this year. According to the report put out by PIA, 30 of its aircraft suffered bird strike incidents in the first half of 2022. Of these, three incidents occurred on aircraft from the ATR42 family, 23 on aircraft from the Airbus A320 family, and the remaining four occurred on Boeing's 777 family aircraft.

Aircraft Type	**Number of incidents from Jan 2022 – June 2022**
ATR42	3
Airbus A320-200	23
Boeing 777-200ER	2
Boeing 777-300ER	2
Total	**30**

From the total figure, eight incidents took place when PIA aircraft were on approach, while just one each occurred during the climb and descent phase. With 11 incidents, final landing activities saw the most occurrences, while incidents of bird strikes during take-off activities were limited to six. Phases of flight for the remaining three incidents could not be determined. The report by PIA also went into detail regarding the locations of these incidents. Approximately a dozen of the total incidents occurred at Allama Iqbal International Airport (LHE) in Lahore, followed by Islamabad International Airport (ISB) with six incidents. Next up, five incidents occurred at Jinnah International Airport (KHI) in Karachi and three similar bird strikes at Quetta International Airport (UET). Lastly, PIA aircraft suffered two bird strikes at Bacha

Khan International Airport (PEW) in Peshawar and one each at Sialkot International Airport (SKT) and Damam Airport.

Karachi's Jinnah International Airport came in a very close second with 192 incidents, followed by Islamabad International Airport at 100 incidents. SKT airport saw 53 incidents in the last five years, while PEW was next on the list with 40. Multan, Faisalabad, and Quetta saw 26, 22, and 17 incidents, respectively. Unfortunately, the monsoon season in South Asia will further increase the risk of bird strikes on aircraft.

Recommendations:

1) Identification of features near Bacha khan international airport through GIS and remote sensing, the features are; wetlands, ditches, agriculture, forested/shrub areas, infrastructure etc.
2) Environmental impact assessment and various ecological studies should be conducted annually.
3) Through habitat management air fields should be made unattractive for birds in order to avoid unwanted situation of bird strikes.
4) Where particular plants and seeds within airport area are seen to attract birds and other animals need to removed and replaced by other plant varieties.
5) Management of grasses and trees should be done timely before exceeding the prescribed heights to discourage unnecessary bird arrival.
6) Various actions are required from district administration to ensure garbage disposal, cleaning around the airport during Eid Ul Azha.

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References:

1) EASA. Bird population trent and their impact of aviation safety 1999-2008.
2) Dolbeer, RA; Begier, M.J.;Miller, P.R.;Weller,J.R; Anderson,A.L. Wildlife Strikes to civil Aircrafts in the United states 1990-2018.
3) Merchant et al. (l990), Milsom (l990), Pomeroy and Hepner (1992), Hild (1995), Demarchi (1996), Ferns (l996), Seubert (l996), Vantets (l996),
4) Ferns, PN. 1996. Monitoring birds activity on British airfields. Vogel und Luftverkehr Bd. 2/96:47-56.
5) Baxter, A. 2001. Gull movements in Europe (Part of the evaluation of bird control techniques on landfills sites). NWET Ltd. Trust news issue.8:7-10.
6) Burma, LS. 1998. Long grass surveillance radars as indicators of birds numbers. Vogel und Luftverkehr. Bd.1-2/98:107-122.
7) Hahn, BK. 2004. The natural environmental features of the air field of Holzdorr and measures for bird strike prevention. Bird and Aviation. 24:1:68-73.
8) Hild, J. and Morgenroth, K. 2004. The significance of habitat structure and vegetation for the prevention of bird strikes at Friedrichshafen Airport. Bird and aviation. 24: 1:15-19.
9) Marchant, JH., Hudson, R. Carter, SP. and Whittington, P. 1990. Populations trend in British breeding birds. British trust for ornithology Hertfordshive.
10) Milsom, TP. 1990. Lapwings Vanallus vanallus on aerodromes the birds strike hazards. Ibis. 132:218-231.
11) Pomeroy, H. and Hepner, F. 1992. Structure and turning in airborne Rock Dove Columbia livia, flocks near airports. The Auk. 190:2:256-267.
12) Dolbeer, RSP. and Escherfelder. 2003. Amplified birdstrike risks related to population increase of large birds in North America.
13) Richardson, W.Jand T. West. 200o. Serious bird- strike accidents to military aircraft.
14) Khan, A.A. 1998. Air accidents in spite of high efficiency. DEF. J. (Pak.), Aug. 1998 issue.
15) Godin, Alfred J. "Birds at airports." (1994).

16) Witmer, G. W., & Fantinato, J. W. (2003). Management of rodent populations at airports. *USDA National Wildlife Research Center-Staff Publications*, 291.

17) Upadhyaya, Bashanta Kumar and Dolbeer, Richard A., "Management of bird and other wildlife hazards at Tribhuvan International Airport, Kathmandu, Nepal" (2001). 2001 Bird Strike Committee-USA/Canada, Third Joint Annual Meeting, Calgary, AB. 13.

18) Industry Issue: 30 PIA Aircraft Have Had Birds Strikes This Year BYDEVANSH MEHTA PUBLISHED JUL 04, 2022

19) Primus and Furcolow (l997), Hahn (1997), Dolbeer et al., 1998), Hild And Muentze (2000), Baxter (2001), Hild (2002), Burma (2003) Hild and Morgenroth (2004), Hahn (2004) and Martin et al. (2011) on roosting of birds near air fields and their effect on air craft flights safety.