e-planet **17** (1): 62-69 (June 2019)

Avifauna diversity of YSPUHF campus, Nauni, Solan, Himachal Pradesh, India

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Date of receipt: 11.04.2019 Date of acceptance: 26.06.2019

ABSTRACT

Avifaunal diversity of YS Parmar University of Horticulture and Forestry (YSPUHF) campus was studied by using Point Count method. Points were selected and point counts were carried on early in the morning from 6:30 a.m. to 9:00 a.m. and from 4:00 p.m. to 6:00 p.m. in the evening from October 2018 to May 2019. Total 156 species of birds belonging to 16 orders and 52 families were recorded. Order Passeriformes was found dominant (66.03% occurrence) with 33 family of birds. Order such as Ciconiiformes, Apodiformes, Falconiformes, Caprimulgiformes were found least occurred (0.64 % occurrence each) with only one family of bird each. Steppe eagle (*Aquila nipalensis* H.) and Egyptian vulture (*Neophron percnopterus* L.) which fall under Endangered (EN) category of IUCN were observed. Species like River lapwing (*Vanellus duvaucelii* L.), Himalayan griffon vulture (*Gyps himalayensis* Hume) and Indian alexandrine parakeet (*Psittacula eupatria* L.) which are near threatened are also observed. University campus provides comfortable shelter, suitable grounds for foraging, roosting, site for reproduction and nesting, protection from predation and hostile atmospheric conditions to these birds. But more efforts should be made to protect endangered and near threatened species of birds in the region and the country as a whole.

Key words: Avifaunal diversity, endangered, IUCN, point count method

INTRODUCTION

Birds are related to forests as long as they come in existing, since their origin birds have heterogeneous to occupy a unprecedented array of habitats and hunt ways incomparable with the other terrestrial vertebrates. Birds provide associate huge gift to the forest ecosystem by acting as dispersing agents and as insectivores. Thus birds are revered not just for conserving ecological balance however additionally for merchandise of economic importance (Simeone et al., 2002). Study of avifaunal diversity is an essential ecological tool which acts as an important indicator to evaluate different habitats both qualitatively and quantitatively (Bilgrami, 1995). Currently avifauna are incessantly vulnerable by drivers like environs loss, forest degradation, hunting, pollution, invasive species and diseases (Sodhi et al., 2011) as population of birds are terribly sensitive to degree of pollution in each terrestrial and aquatic system (Gaston, 1975; Hardy et al., 1987).

Research on avifauna in Asian country has shown that 80 per cent of the birds of the Indian landmass are found within the Indian Himalayan region (Price et al., 2003). Substantial numbers of bird species also are found in lower region of Himachal Pradesh nearer to the university campus. It has been stated that the estimation of native densities of fauna helps to grasp the abundance of assorted species of different organisms (Turner, 2003). Documentation on bird diversity is a pressing need to study the

dynamics and socioeconomic parameters outside the protected areas, especially in urban areas and university campuses. Keeping in view of this facts, investigation had undertaken in UHF, Nauni campus to produce a base-line data on the avifaunal diversity and to gain the ensuing impact of global climate change on avifaunal species diversity.

MATERIALS AND METHODS

The present study was undertaken in Dr. Yashwant Singh Parmar University of Horticulture and Forestry campus, which is situated in Nauni village of Solan district, Himachal Pradesh, India. It covers an area of 5.5 km². The terrain of the campus is almost hilly and the elevation gradually varies from 1184-1207 m. The campus is predominantly covered with tree species of chir pine, bottle brush, Chinese rain tree, etc. The available climatic data reveals that the annual rainfall varies from 1350-1750 mm. Mean monthly temperature for the study period was 17.4°C. The mean maximum and minimum temperature were recorded 24°C and 04°C, respectively.

Points were selected and point counts were carried on early in the morning from 6:30 a.m. to 9:00 a.m. and from 4:00 p.m. to 6:00 p.m. in the evening from October 2018 to May 2019. Observations not made between these timings were also added to prevent missing of any species from the list. Point counts were avoided in bad climatic conditions. The birds were identified with the help of Nikon 10 X 42 binoculars, their calls and by their photographs. The photographs were shot with Nikon DSLR camera with 300 mm lens. Birdlife International (2016) was used for threat category. Manakadan and Pittie (2001) was followed for nomenclature and taxonomy of bird species. Birds were classified under resident or migratory status as per Ali and Ripley (1987). Frequency of sighting of the birds were categorized according to their occurrence in the study site such as common (C), uncommon (UC), rare (R) and occasional (O).

Occurrence of the order of the bird is obtained by using the following formula:

$$\text{Percentage occurrence} = \frac{\text{No. of spp. of each order}}{\text{Total no. of species of different order}} \times 100$$

RESULTS AND DISCUSSION

The results obtained from the present study showed that 156 species of birds belonging to 16 orders and 52 families were present in Y S Parmar UHF, Solan. Out of all, order Passeriformes was found dominant (66.03% occurrence) with 103 types of species belonging to 33 families. Order such as Ciconiiformes, Apodiformes, Falconiformes, Caprimulgiformes were found least occurred (0.64 % occurrence each) with only 01 species (Fig. 1 and Table 1).

Under International Union for Conservation of Nature and Natural Resources (IUCN) protection status, species like River lapwing (*Vanellus duvaucelii)*, Himalayan griffon vulture (*Gyps himalayensis*) and Indian alexandrine parakeet (*Psittacula eupatria*) were Near Threatened (NT) however species like Steppe eagle (*Aquila nepalensis*) and Egyptian vulture (*Neophron percnopterus*) were under Endangered (EN) category. The other species belong to least concern (LC) category (Table1).

The study revealed that there were two bird species under endangered (EN) and three species under near threatened (NT) category according to IUCN protection status. So it demands immediate action for conserving their population in the study site.

Among the avifauna, 107 were residents (69%), 47 were migrants including 24 winter visitors (15%) and 23 summer visitors (15%), 2 passage visitors (1%) [Fig 2]. Further analysis on frequency of sighting revealed that 90 species were common (57.69%), 5 species were very common (3.21%), 19 species were fairly common (12.18%), 28 species were uncommon (17.95%), 2 species were rare (1.28%) and 12 species were very rare (7.69%) (Table 1).

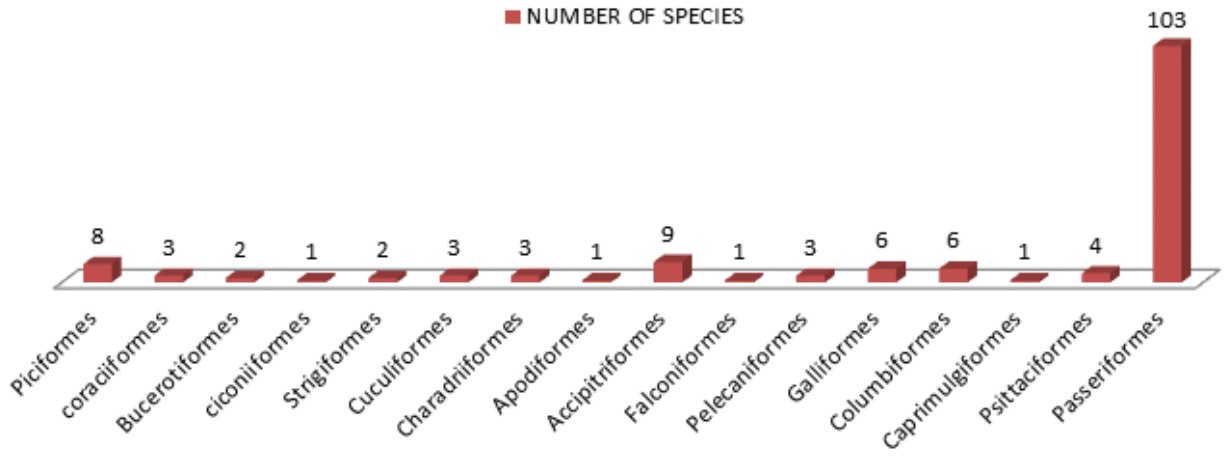

Fig. 1. Occurrence of orders(s) with respect to belonging species of birds

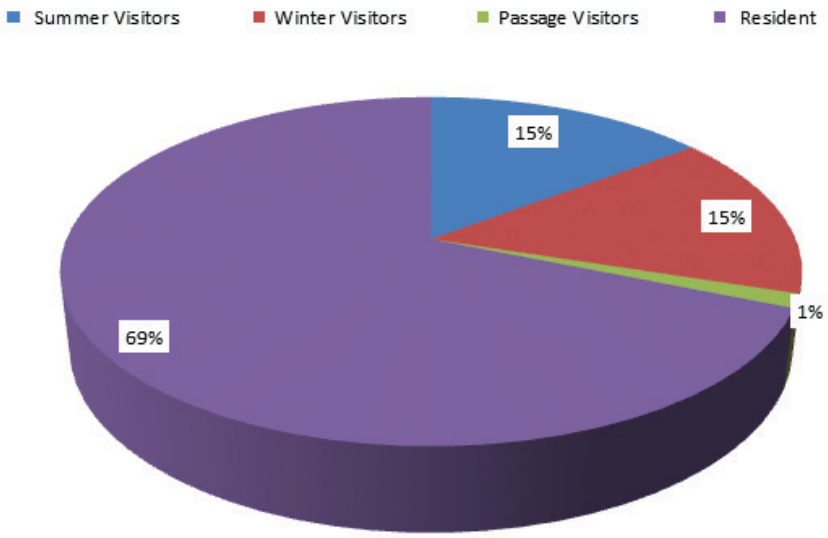

Fig. 2. Representing migratory status of avian species

Birds are used for assessing ecosystem quality (Ridley et al., 1984). To have long term conservational measure it is necessary to have knowledge about species diversity present in an area. The high richness of species diversity in the study site may be attributed to its geographical location, heterogeneity of land characteristics and number of tree and shrub diversity which makes the campus complex structurally. Empirical and theoretical evidence have also proved that species richness is highly influenced by complex landscape. (Lawton, 1999; Gaston, 2000).

There are several other factors which support such number of bird species in the university campus such as availability of food material, suitable sites for nesting, low temperature throughout the year, easy availability of nesting material which have also with (Margules et al., 2000).

From the result of current study, it is inferred that university campus provides comfortable shelter, suitable grounds for foraging, roosting, site for reproduction and nesting, protection from predation and hostile atmospheric conditions to these birds.

Table 1. Occurrence and conservation status of bird species in UHF campus

Order	Family	Name of the species	Abundance	IUCN status	Migration status
Piciformes	Megalaimidae	Great Barbet (*Psilopogon virens*)	C	LC	R
		Blue Throated Barbet (*Psilopogon asiaticus*)	FC	LC	R
	Picidae	Greater flameback Woodpecker (*Chrysocolaptes guttacristatus*)	R	LC	R
		Grey Headed Woodpecker (*Picus canus*)	FC	LC	R
		Lesser Yellownape woodpecker (*Picus chlorolophus*)	FC	LC	R
		Fulvous breasted Woodpecker (*Dendrocopos macei*)	C	LC	R
		Grey Capped Pygmy Woodpecker (*Yungipicus canicapillus*)	C	LC	R
		Speckled Piculet (*Picumnus innominatus*)	FC	LC	R
Coraciiformes	Alcedinidae	White Breasted Kingfisher (*Halcyon smyrnensis*)	C	LC	R
		Crested Kingfisher (*Megaceryle lugubris*)	C	LC	R
	Meropidae	Green Bee Eater (*Merops orientalis*)	FC	LC	R
Bucerotiformes	Upupidae	Common Hoopoe (*Upupa epops*)	C	LC	R
	Bucerotidae	Indian Grey Hornbill (*Ocyceros birostris*)	R	LC	R
Ciconiiformes	Ciconiidae	Black Stork (*Ciconia nigra*)	R	LC	PV
Strigiformes	Strigidae	Brown Fish Owl (*Ketupa zeylonensis*)	R	LC	R
		Asian Barred Owlet (*Glaucidium cuculoides*)	C	LC	R
Cuculiformes	Cuculidae	Asian koel (*Eudynamys scolopaceus*)	C	LC	R
		Common Hawk Cuckoo (*Hierococcyx varius*)	C	LC	R
		Greater Coucal (*Centropus sinensis*)	FC	LC	R
Charadriiformes	Scolopacidae	Eurasian Cuckoo (*Cuculus canorus*)	FC	LC	SV
	Charadriidae	Red Wattled Lapwing (*Vanellus indicus*)	C	LC	R
		River Lapwing (*Vanellus duvaucelii*)	R	NT	R
Apodiformes	Apodidae	House Swift (*Apus nipalensis*)	VC	LC	R
Accipitriformes	Accipitridae	Crested Serpent Eagle (*Spilornis cheela*)	C	LC	R
		Steppe Eagle (*Aquila nipalensis*)	UC	EN	WV
		Bonelli's Eagle (*Aquila fasciata*)	VR	LC	R
		Black Kite (*Milvus migrans*)	UC	LC	R
		Black Winged Kite (*Elanus caeruleus*)	FC	LC	R
		Shikra (*Accipiter badius*)	FC	LC	R
		Egyptian Vulture (*Neophron percnopterus*)	VR	EN	SV
		Eurasian Griffon Vulture (*Gyps fulvus*)	C	LC	WV
		Himalayan Griffon Vulture (*Gyps himalayensis*)	C	NT	R
Falconiformes	Falconidae	Common Kestrel (*Falco tinnunculus*)	R	LC	WV
Pelecaniformes	Ardeidae	Indian Pond Heron (*Ardeola grayii*)	C	LC	R
		Striated Heron (*Butorides striata*)	FC	LC	R
		Cattle Egret (*Bubulcus ibis*)	R	LC	R

Galliformes	Phasianidae	Black Francolin (*Francolinus francolinus*)	C	LC	R
		Grey Francolin (*Francolinus pondicerianus*)	C	LC	R
		Jungle Bush quail (*Perdicula asiatica*)	C	LC	R
		Red Jungle Fowl (*Gallus gallus*)	C	LC	R
		Indian Peafowl (*Pavo cristatus*)	UC	LC	R
		Kalij Pheasant (*Lophura leucomelanos hamiltoni*)	C	LC	R
Columbiformes	Columbidae	Rock Dove (*Columba livia*)	C	LC	R
		Oriental Turtle Dove (*Streptopelia orientalis*)	C	LC	R
		Asian Emerald Dove (*Chalcophaps indica*)	UC	LC	R
		Eurasian Collared Dove (*Streptopelia decaocto*)	UC	LC	R
		Spotted Dove (*Spilopelia chinensis*)	C	LC	R
		Laughing Dove (*Spilopelia senegalensis*)	C	LC	R
Caprimulgiformes	Caprimulgidae	Large tailed Nightjar (*Caprimulgus macrurus*)	FC	LC	R
Psittaciformes	Psittaculidae	Rose Ringed parakeet (*Psittacula krameri*)	C	LC	R
		Plum Headed Parakeet (*Psittacula cyanocephala*)	C	LC	R
		Slaty Headed parakeet (*Psittacula himalayana*)	C	LC	R
		Indian Alexandrine parakeet (*Psittacula eupatria*)	FC	NT	R
Passeriformes	Hirundinidae	Barn Swallow (*Hirundo rustica*)	C	LC	SV
		Wire Tailed Swallow (*Hirundo smithii*)	FC	LC	SV
		Red Rumped Swallow (*Cecropis daurica*)	UC	LC	SV
	Emberizidae	Rock Bunting (*Emberiza cia*)	C	LC	WV
		White Capped Bunting (*Emberiza stewarti*)	C	LC	WV
		Crested Bunting (*Melophus lathami*)	C	LC	SV
		Chestnut Eared Bunting (*Emberiza fucata*)	R	LC	R
	Campephagidae	Long Tailed Minivet (*Pericrocotus ethologus*)	C	LC	SV
	Passeridae	House Sparrow (*Passer domesticus*)	C	LC	R
		Russet Sparrow (*Passer rutilan*s)	C	LC	R
	Nectariniidae	Purple Sunbird (*Cinnyris asiaticus*)	C	LC	SV
		Crimson Sunbird (*Aethopyga siparaja*)	C	LC	R
	Dicaeidae	Fire Breasted Flowerpecker (*Dicaeum ignipectus*)	UC	LC	R
	Muscicapidae	Himalayan Rubythroat (*Luscinia pectoralis*)	UC	LC	SV
		Blue capped Rock Thrush (*Monticola cinclorhynchus*)	UC	LC	SV
		Chestnut Bellied Rock Thrush (*Monticola rufiventris*)	UC	LC	WV
		Himalayan Bluetail (*Tarsiger rufilatus*)	UC	LC	WV
		Indian Robin (*Copsychus fulicatus*)	C	LC	R
		Oriental Magpie Robin (*Copsychus saularis*)	C	LC	R
		Plumbeous water redstart (*Phoenicurus fuliginosus*)	C	LC	R
		Spotted Forktail (*Enicurus maculatus*)	C	LC	R
		White capped Redstart (*Phoenicurus leucocephalus*)	C	LC	R

		Little Forktail (*Enicurus scouleri*)	UC	LC	R
		Common Stonechat (*Saxicola torquatus*)	C	LC	WV
		Pied Bushchat (*Saxicola caprata*)	C	LC	SV
		Gray Bushchat (*Saxicola ferreus*)	C	LC	R
		Brown Rockchat (*Oenanthe fusca*)	C	LC	R
		Rufous Gorgeted Flycatcher (*Ficedula strophiata*)	UC	LC	R
		Verditer Flycatcher (*Eumyias thalassinus*)	C	LC	SV
		Ultramarine Flycatcher (*Ficedula superciliaris*)	FC	LC	SV
		Grey Headed Canary Flycatcher (*Culicicapa ceylonensis*)	C	LC	SV
		Slaty Blue Flycatcher (*Ficedula tricolor*)	UC	LC	WV
		Red Breasted Flycatcher *(Ficedula parva*)	UC	LC	WV
		Rufous Bellied Niltava (*Niltava sundara*)	UC	LC	WV
		Rusty Tailed Flycatcher (*Ficedula ruficauda*)	UC	LC	PV
		Asian Brown Flycatcher (*Muscicapa latirostris*)	UC	LC	SV
		Blue Whistling Thrush (*Myophonus caeruleus*)	C	LC	R
		Blue Capped Redstart (*Phoenicurus coeruleocephala*)	C	LC	R
	Estrildidae	Scaly Breasted Munia (*Lonchura punctulata*)	C	LC	R
	Prunellidae	Black Throated Accentor (*Prunella atrogularis*)	UC	LC	WV
		Rufous breasted Accentor (*Prunella strophiata*)	R	LC	WV
	Fringillidae	Common Rosefinch (*Carpodacus erythrinus*)	C	LC	SV
		Pink Browed Rosefinch (*Carpodacus rodochroa*)	UC	LC	WV
		Yellow breasted Greenfinch (*Chloris spinoides*)	C	LC	WV
		European Goldfinch (*Serinus pusillus*)	C	LC	R
		Red Fronted Serin (*Serinus pusillus*)	C	LC	WV
	Certhiidae	Bar Tailed Treecreeper (*Certhia himalayana*)	C	LC	WV
	Sittidae	Chestnut Bellied Nuthatch (*Sitta cinnamoventris*)	C	LC	R
	Tichodromidae	Wallcreeper (*Tichodroma muraria*)	C	LC	WV
	Sturnidae Sturnidae	Common Myna (*Acridotheres tristis*)	C	LC	R
		Jungle Myna (*Acridotheres fuscus*)	C	LC	R
		Brahminy Starling (*Sturnia pagodarum*)	C	LC	R
		Chestnut Tailed Starling (*Sturnia malabarica*)	C	LC	SV
		Spot Winged Starling (*Saroglossa spilopterus*)	C	LC	SV
	Turdidae	Black Throated Thrush (*Turdus atrogularis*)	R	LC	WV
	Cisticolidae	Striated Prinia (*Prinia crinigera*)	C	LC	R
		Plain Prinia (*Prinia inornata*)	C	LC	R
		Jungle Prinia (*Prinia sylvatica*)	C	LC	R
		Grey Breasted Prinia *(Prinia hodgsonii*)	C	LC	R
		Common Tailorbird (*Orthotomus sutorius*)	C	LC	R
	Pycnonotidae	Black Bulbul (*Hypsipetes leucocephalus*)	VC	LC	R
		Red Vented Bulbul (*Pycnonotus cafer*)	VC	LC	R

		Himalayan Bulbul (*Pycnonotus leucogenys*)	VC	LC	R
	Phylloscopidae	Common Chiffchaff (*Phylloscopus collybita*)	UC	LC	WV
		Hume's leaf warbler (*Phylloscopus humei*)	C	LC	WV
		Western Crowned warbler (*Phylloscopu occipitalis*)	UC	LC	SV
		Grey Hooded warbler (*Phylloscopus xanthoschistos*)	C	LC	R
	Timaliidae	Black Chinned Babbler (*Cyanoderma pyrrhops*)	VC	LC	R
		Rusty Cheeked Scimitar Babbler (*Pomatorhinus erythrogenys*)	FC	LC	R
		White Browed Scimitar Babbler (*Pomatorhinus schisticeps*)	UC	LC	R
	Leiothrichidae	White Crested Laughing Thrush (*Garrulax leucolophus*)	C	LC	R
		White Throated Laughing Thrush (*Garrulax albogularis*)	UC	LC	R
		Streaked Laughing Thrush (*Trochalopteron lineatum*)	C	LC	R
		Red Billed Leiothrix (*Leiothrix lutea*)	C	LC	R
		Rufous Sibia (*Heterophasia capistrata*)	C	LC	R
		Jungle Babbler (*Argya striata*)	C	LC	R
	Zosteropidae	Oriental White Eye (*Zosterops palpebrosus*)	C	LC	R
		Whiskered Yuhina (*Yuhina flavicollis*)	C	LC	R
	Cinclidae	Brown Dipper (*Cinclus pallasii*)	C	LC	R
	Motacillidae	White Wagtail (*Motacilla alba*)	FC	LC	SV
		Grey Wagtail (*Motacilla cinerea*)	C	LC	WV
		White Browed Wagtail (*Motacilla maderaspatensis*)	C	LC	R
		Tree Pipit (*Anthus trivialis*)	C	LC	WV
	Pellorneidae	Puff Throated Babbler (*Pellorneum ruficeps*)	UC	LC	R
	Corvidae	Red Billed Blue Magpie (*Urocissa erythroryncha*)	C	LC	R
		Yellow Billed Blue Magpie (*Urocissa flavirostris*)	C	LC	R
		Rufous Treepie (*Dendrocitta vagabunda*)	UC	LC	R
		Grey Treepie (*Dendrocitta formosae*)	C	LC	R
		Large Billed Crow (*Corvus macrorhynchos*)	C	LC	R
	Laniidae	Long tailed shrike (*Lanius schach*)	UC	LC	R
	Dicruridae	Black Drongo (*Dicrurus macrocercus*)	C	LC	R
		Hair Crested Drongo (*Dicrurus bracteatus*)	C	LC	R
		Ashy Drongo (*Dicrurus leucophaeus*)	C	LC	SV
	Oriolidae	Indian Golden Oriole (*Oriolus kundoo*)	R	LC	SV
	Rhipiduridae	White Throated Fantail (*Rhipidura albicollis*)	C	LC	R
		Yellow Bellied Fantail (*Chelidorhynx hypoxantha*)	C	LC	WV
	Monarchidae	Asian Paradise Flycatcher (*Terpsiphone paradisi*)	UC	LC	SV
	Paridae	Great Tit (*Parus cinereus*)	C	LC	R
		Himalayan Black Lored Tit *(Machlolophus xanthogenys*)	FC	LC	R

		Black Throated Tit (*Aegithalos concinnus*)	C	LC	R
		Green backed Tit (*Parus monticolus*)	R	LC	R
	Vangidae	Common Woodshrike (*Tephrodornis pondicerianus*)	FC	LC	R
	Sylviidae	Yellow Eyed Babbler (*Chrysomma sinense*)	FC	LC	R

C: Common, R: Rare, FC : Fairly Common, LC: Least concern, NT: Near threatened, EN: Endangered, WV: Winter visitor, SV : summer visitor, R: Resident

CONCLUSION

The survey being first of its kind in this area which provides a baseline information about bird diversity present at YSPUHF campus. This study creates awareness on documention of birds in other university campuses of Himalayan region. This type of survey is important to monitor and conserve bird diversity where construction of roads and buildings replace green vegetation damaging their habitat. Further research on bird species behavior, feeding strategy and their role in deciding vegetation of an area by playing significant role in plant pollination and seed dispersal is highly necessary for better conservation and long term monitoring of bird diversity. Although there are natural forest in the campus as shelter of bird, still there is need of awareness campaign and bio-monitoring programmes for maintaining and protecting their numbers in university campus.

ACKNOWLEDGEMENT

Authors express their deep sense of gratitude towards our esteemed teacher and Dean of the College of Forestry, YSPUHF, Nauni, Solan for their support during the study period. We are also thankful to Dr. Hari Chand Sharma, Former VC of this university for his support and encouragement.

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